Journal of the
Indian Medical Association

VOL. XVI, No. 10 CALCUTTA JULY, 1947

THE RELATION BETWEEN INFANTILE CIRRHOSIS OF THE LIVER AND A DIET OF POLISHED RICE.*

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INTRODUCTION

Geographical distribution of the disease—The peculiar geographical distribution of the disease was a feature which attracted the attention of the earliest writers on this subject. Mackenzie (1894) recorded cases of infantile cirrhosis in Kanara and South West Coast of Bombay noting at the same time its scarcity in Bombay, Sind, Gujarat, Aden and Deccan. Pearce (1909) included Madras also as an endemic area, and Singh recorded cases from United Provinces as well. Castellani and Chalmers (1919), Byam and Archibald (1922) noted the prevalence of the disease in Calcutta chiefly. De Costa (1923) reported a case from Nagpur. Vaidyanath Iyer (1926) reported cases from Tellicherry on the West Coast of India and Krishna Iyer (1927) came across the disease in the Tamil districts and in the eastern districts of South India. Manson-Bahr (1927) described the disease as occurring in Bengal, Madras, United Provinces and Bombay. Mukerji (1927) in his attempt to study the geographical distribution of 'infantile cirrhosis' has left a valuable record of the endemic areas for this disease. According to him, they are Calcutta, and various districts of Bengal, Madura, Ramnad, Tanjore, Pudukotta, in the Madras Presidency, a few cases from Mysore, and some from United Provinces and Bombay. Phillipe Rezek (1928) from his study of the distribution of the disease found that it was only found in Bengal and South India (in the surroundings of Madras, and Vizagapatam). On considering the incidence of the disease in its relation to the diet in different parts of India we arrive at the definite connection between it and the rice eating population of India. It is estimated that over a third of the population in India live on rice. Moreover if we exclude the deltas of the great rivers and the narrow coastal strip, rice is a rare crop throughout the rest of the peninsula. It is exclusively the staple diet where it is grown. The out-turn of rice is greatest in Bengal and Assam. A large percentage of the acreage is under rice cultivation in the deltas of Godavari, Kistna, and Cauvery, in the low lands of Travancore, Malabar, and Kanara. In the North Western Provinces it is grown only in the damp localities and forms the favourite food for the upper classes. In Madras, the area under rice cultivation is about 33 per cent of the food growing area; in Bombay it is 10 per cent, in Sind it is 17 per cent, in the Central Provinces 34 per cent, and in the Punjab 5 per cent. Of the 2/5 of India under Indian Provinces, which cover the centre of the peninsula, scarcely any rice is grown. It will be seen from a study of the literature that the incidence of infantile cirrhosis is greatest in Bengal and Madras Provinces, in the deltas of the great rivers, and along the long strip of land fringing the coast. Bhaskara Menon and Annamalai (1934-35) from their study of the incidence of hepatic cirrhosis in South India find a high incidence of death from cirrhosis in Madras. They also report that the incidence of cirrhosis is 6·9 per cent in the autopsies in Calcutta, 9·3 per cent in 538 autopsies in Vizagapatam, whereas Berlin figures indicate only 1 per cent in 3,2000 autopsies. In Java, where the population live almost exclusively on rice, mortality from cirrhosis is 10 times that seen in an European population of the same age and sex in Holland.

Ethnological and Social considerations—Reports of cases of infantile cirrhosis from whatever source it may be always agree on one point and that is the incidence of the disease exclusively among the rich upper and middle class families. On analysing the diet of various classes of people and the market value of the different varieties of grains available in an area for consumption, it will be seen that it is the wealthy upper and middle class families who live almost exclusively on rice in the rice growing districts. The whiteness of the polished rice is preferred by them to the coarser but more nourishing unpolished or parboiled rice.

The poor people who form the bulk of the population live on the different varieties of millet that are grown in all parts of India. The lower middle class whose staple diet is rice in the rice growing areas, invariably live on unpolished parboiled, or hand pounded rice. Infantile cirrhosis is rarely if ever seen in those families and in the poor who live on millets.

Dietetic habits—Ever since the disease attracted the notice of the medical profession it was observed

* The following experimental work was carried out in the University of Edinburgh during the period 1939 to 1941, and formed part of a thesis on "The Studies on Infantile Cirrhosis of the liver and on the effect of cirrhogenic toxins on the progeny". An abstract from the thesis was published in the *J. Path. & Bact.*, **54**:289-296. 1942 under the title "An Experimental Study on Placental Permeability to Cirrhogenic Poisons". The expenses of this research was defrayed by the Moray Endowment Fund of the University of Edinburgh.

that the incidence of the disease was much greater among the Hindus than among the Mohammedans, Anglo-Indians, Indian Christians and Europeans. The health officer's report of the mortality in infants in Calcutta due to this disease show a marked disproportion between the death rate for Hindu and Mohammedan children, despite the fact that the population of Hindus and Mohammedans are about equal in Calcutta.*

The death rate due to infantile cirrhosis in Calcutta according to the Health Officer's Report for three years 1891-1893 is as follows:

Year	*Hindus*	*Mohammedans*
1891	.. 486	21
1892	.. 546	30
1893	.. 584	29

In Madras the disease is seen more frequently among the Brahmins than in the rest of the population put together, even though the Brahmins form only a small percentage of the population. In a "preliminary report on the prevalence of infantile biliary cirrhosis in the Mysore State", Sankara Iyer reports that out of 60 cases seen by him 90 per cent were among Brahmins. The reason is not far to seek as it is well known that Mohammedans, Indian Christians, Anglo-Indians and Europeans live on a mixed diet containing a large proportion of animal protein, whereas many communities among Hindus are strict vegetarians. It is also a fact that in many Hindu families where the husband is a meat eater, the wife is a strict vegetarian because of religious scruples. In South India especially the Brahmin community as a whole never take meat, fish or egg in any form, and a large body of non-Brahmin Hindus are also strict vegetarians. J. N. Ghose (1894) observed that Mohammedans and Europeans fed their children occasionally with animal broth, whereas the Hindu mother always nourished her children from her breast. Tirumurti and Radhakrishna Rao (1934) and others have commented on the incidence of the disease among vegetarians.

Another factor which may be of some significance in considering the etiology of the disease is that before the year 1874 there is no record of this disease. Ghose (*loc. cit.*) called it a new disease as it had not been treated in the medical books of his time. It is more than probable that the appearance of the disease coincides with the date from which highly milled rice became popular among rice consumers in towns.

Nakahara, Fijiwara and Mori (1939) in their study on cancer development in the liver have noted a certain geographical similarity in the occurrence of beri-beri and hepatoma in man. Though there is a similar geographical distribution there has been no report of a greater incidence of cirrhosis among sufferers from beri-beri; nor did any of these cases of 'infantile cirrhosis' show symptoms of beri-beri. What exactly was the principle that was lacking in the vegetarian diet of polished rice which while not lacking in vitamin B complex yet helped to bring about liver damage was the question that required a solution. A perusal of the work of Paul Gyorgy and Harry Goldblatt (1939) on the production of liver necrosis in rats on a nutritional basis sheds some light on the subject. They found that in rats placed on a diet that was adequate in all essentials, but was wanting in yeast eludate (yeast extract) developed extensive necrosis of the liver and sometimes cirrhosis.

During the process of milling and polishing the rice, it is the germ or embryo that is first to be removed. It is this germ that is rich in nucleic acid and purine substances in addition to the vitamin B complex. Wheat germ has often been used as a rich source from which to extract nucleic acid. The germ of the rice is also rich in the supply of nucleic acid. Bearing these facts in mind the present experiments were carried out to determine the effect on the offsprings of a parent when it is fed on a basic diet, and essential vitamins, and at the same time subjected to the action of carbon tetrachloride.

Experimental Production of Liver Damage in Suckling Rats whose Parent is Fed on Polished Rice and Vitamins and is Subjected at the Same Time to the Action of Cirrhogenic Poison

Material and Methods of Study—The principal difficulty in chosing a diet consisting mainly of polished rice was the supply of essential vitamins without including in the diet at the same time the antinecrotic factor. It was found that pregnant rats frequently aborted and that postnatal mortality of the litter was high in test animals that were fed only on polished rice, vitamin B, wheat germ oil, and cod liver oil. As a result it was decided that the experiment could best be carried out with a normal diet during pregnancy and with a special diet during lactation. It was impossible because of the war to obtain either riboflavine or vitamin B_6 from any of the chemical firms in Great Britain, and the difficulty was partly solved by feeding the animals on polished rice with wheat germ oil, cod liver oil, vitamin B_1 and adding just enough yeast to keep the litter alive. It was found that unless a certain minimum of yeast was added to the diet of the nursing mother the litter did not survive for more than a week.

The basic diet in the experiment consisted of:—

Polished rice	.. 10 grams.
Sodium chloride	.. 0·1 gram.
Cod liver oil	.. 2 minims.
Wheat germ oil	.. 0·5 minims.
Vitamin B_1	.. 10 international units.

(The vitamin B_1 was obtained in the form of 'Benerva' tablets. (Roche). One tablet was dissolved in 33·3 c.c. of distilled water so that one c.c. contained (10 international units of B_1).

To this, varying amounts of yeast and sometimes meat and casein were added, depending on the experiment.

Preparation of the diet—The polished rice was washed well three times in different changes of water, and boiled with five times its bulk with water for 20 minutes. The excess of water was strained off. When cold, sodium chloride, cod liver oil, wheat germ oil, and vitamin B_1 were added and mixed well. Rice

* The statement is incorrect—Editor, *J. Indian M. A.*

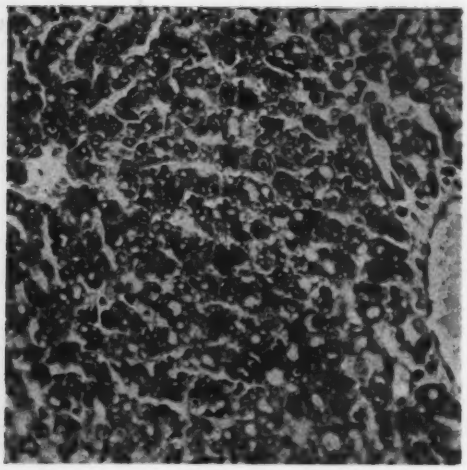

FIG. 1—Liver of control litter aged 18 days showing a hepatic and a portal terminal. The cells are well preserved but there is a slight infiltration of fat. The cells in the centre as well as in the periphery of the lobules are well stained.

H. and E × 350.

FIG. 2—Liver of litter 18/VI aged 29 days showing collapse and condensation of reticulum beginning at the centre and extending radially to the neighbouring lobules. There is some collagenization of the reticulum fibres. Except for islands of healthy liver cells at the periphery of the lobule the rest show marked hydropic degeneration. The mother of this animal was fed on special diet and received 0·2 c.c. of carbon tetrachloride twice weekly.

H. and E × 80.

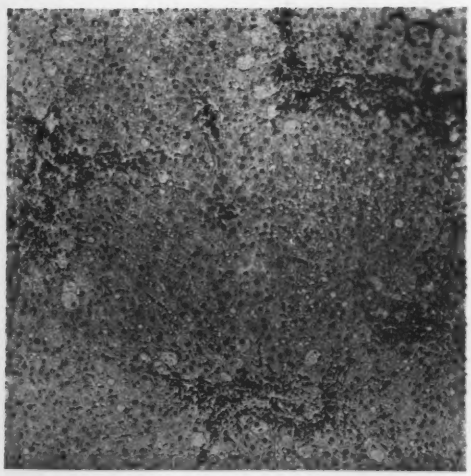

FIG. 3—Liver of rat 18 showing slight necrosis with cellular infiltration at the centre of the lobules. When compared to the liver of the litter the changes here are slight.

H. and E × 80.

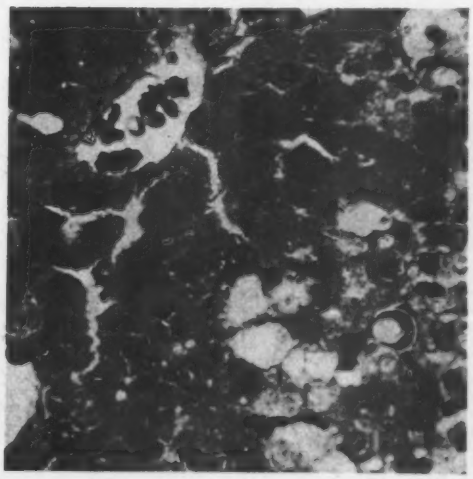

Fig. 4—Liver of litter 20/II aged 22 days showing necrosis and hydropic degeneration of liver cells in the centre of the lobule, and healthy cells at the periphery. Numerous mitotic figures are seen in the field.

H. and E × 500.

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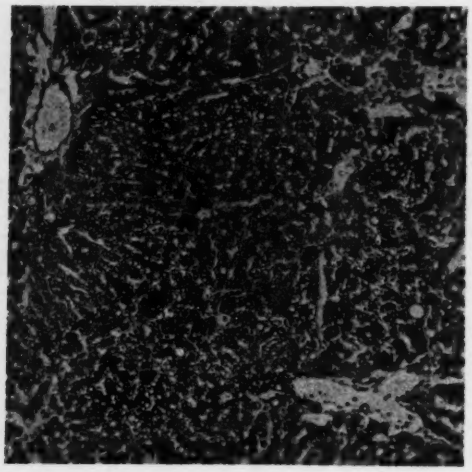


FIG. 5—Liver of rat 20 which had received 9 injections of 0·2 c.c. of carbon tetrachloride at intervals of three to four days during lactation. Liver cells show slight fatty change. No necrosis or hydropic degeneration is observed.

H. and E × 80.

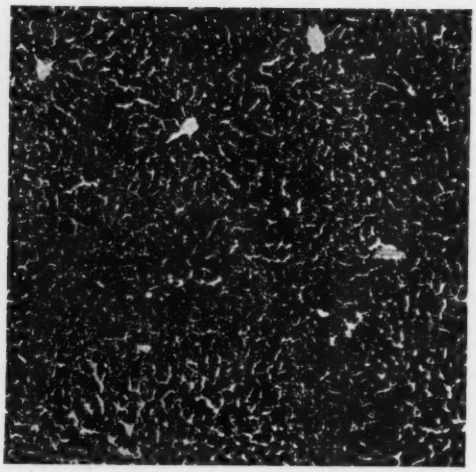


FIG. 6—Liver of litter 33/II aged 16 days whose mother was fed on basic diet and 3 grams of meat while receiving 0·2 c.c. of carbon tetrachloride twice weekly at the same time. Slight fatty change at the centre of the lobule is observed.

H. and E × 20.

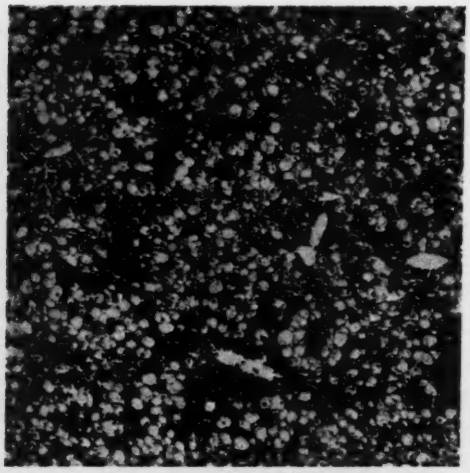


FIG. 7—Liver of litter 33/III aged 23 days showing marked degenerative changes in the liver when the meat in the diet of the mother was discontinued from the 16th. day of lactation. Three zones can be distinguished in the lobule. The central zone showing necrosis, the middle zone where the cells are hydropic, and the peripheral zone of healthy liver cells abutting on the Glisson's sheath.

H. and E × 80.

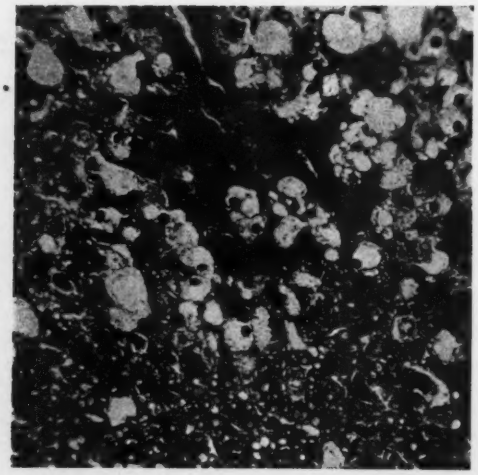


FIG. 8—Liver of litter 39/II aged 26 days whose mother was on special diet and was receiving injections of carbon tetrachloride. Note the area of central necrosis, midzonal hydropic degeneration, and the peripheral healthy zone.

H. and E × 300.

takes up about three times its weight of water when boiled, and the feed was always kept much in excess of the rats' requirement.

It was found by weighing out what was left each day after making due allowance for wastage that a rat consumed per day on an average an amount of boiled rice equivalent to 10 grams of uncooked rice. On the protocol of these experiments the amount in gram of yeast noted is for a diet equal in value to 10 grams of uncooked rice. Two sets of control rats were used (1) Seven control rats with a total litter of 34 fed on normal diet during gestation and lactation. This diet consisted of oats and dog biscuits soaked in milk, with the addition of marmite, cod liver oil and cabbage twice a week. (2) Two control rats No. 37 and 45 with total litter of seven fed during gestation on normal diet and during lactation on the basic diet with the addition of 1 gram and 2·5 grams of yeast respectively. The young were sacrificed at intervals and the livers were examined histologically.

Experiment—Twelve albino rats with total litter of 48 young were employed in this experiment. The date of copulation was noted for each animal through daily examination for vaginal plugs. The mated animals were segregated immediately in separate cages. In most cases the injections were started after the 12th day of gestation. In every case the first dose was 0·1 c.c. and the subsequent doses were 0·15 c.c. of carbon tetrachloride during the period of gestation. The expectant mothers were inspected twice daily so that the number of young in the litter may be checked soon after delivery. The size of the litter in every case was limited to six by killing off the supernumerary. The same day the nursing mother was put on the special diet.

Three animals Nos. 19, 20 and 30 were fed on the basic diet supplemented with 2 to 2·5 gms. of yeast; but in the case of No. 20 the yeast was discontinued from the 10th day of lactation. Five animals Nos. 11, 17, 21, 39 and 44 were fed on the basic diet and 1 gm. of yeast. No. 18 was fed on the basic diet with the addition of 0·5 gm. of marmite thrice weekly. Two animals Nos. 33, 79 were fed on the basic diet with 3 gms. of meat; but the meat was discontinued for the animal No. 33 after the 16th day. One animal No. 83 was put on the basic diet with 3 gms. of casein.

During the lactation each animal was injected with 0·2 c.c. of carbon tetrachloride twice a week subcutaneously between the shoulder blades. Most of the litter were weighed soon after delivery and at intervals to keep record of the rate of growth. The young were sacrificed from time to time and the livers were fixed in 10 per cent formol-saline for histological examination.

Observations

Effect on control litters (Nos. 37 and 45)—There was a definite retardation in the growth of the litter especially in the case of litter No. 37 whose mother was fed on the basic diet with 1 gm. of yeast. In the case of No. 45 the rate of growth did not lag far behind those of the control rats on normal diet. In all the young the stomach contained curdled milk, and the stunting of growth was apparently not due to starvation.

Histologically—The livers of the young did not exhibit any severe hepatic damage, the only change noted being cloudy swelling and increased fattly infiltration.

Effect on the litter of the experimental animals—In the litters No. 19, 20 and 30 whose mothers were fed on the basic diet supplemented with 2 to 2·5 gms. of yeast there was moderate retardation in the average gain in weight of the litter; This lag was most marked in the litter of the rat No. 20 in whose diet the supplement of yeast was discontinued from the 10th day.

In the sucklings, the liver changes were striking during the third and fourth week. There were extensive hydropic degeneration and fatty changes in most of the liver cells leaving only islands of healthy liver cells at the periphery of the lobule in the neighbourhood of the Glisson's sheath. The cells showing hydropic degeneration were ballooned out to a great size. The nuclei were pyknotic and the cytoplasm scanty and granular. In some of these cells there was no stainable cytoplasm and the nuclei had disappeared. There was slight lymphocytic and histiocytic infiltration in the centre of the lobule where degeneration of the cells were most marked. In the healthy peripheral zone a number of mitotic figures were observed in the parenchymal cells. There was moderate proliferation of the Kupffer's cells of the sinusoids. Frequently the sinusoids were inconspicuous due to the swollen condition of the parenchymal cells.

In the case of litter No. 20 whose parent was deprived of the supplement of yeast in the diet after the 10th day the liver showed extensive necrobiosis of the parenchyma involving the central and midzonal regions. The cytoplasm of these cells took a homogeneous pink stain with eosin and the nuclei were swollen, poorly stained or were pyknotic. Some of the nuclei were undergoing karyorrhexis and lysis. Proliferation of Kupffer's cells and histiocytes was marked in the necrotic area. In the healthy peripheral zones of liver lobules abutting the portal tracts, proliferation of the liver cells was seen as evidenced by nuclear division.

The litter of those animals No. 11, 17, 21, 39 and 44, whose mothers were fed on the basic diet with 1 gm. of yeast, showed remarkable lag in the average gain in weight per litter. The young ones took a long time to be weaned completely. No paralysis of the limbs were observed in any of the litter as there was adequate supply of vitamin B_1 in the diet.

The change in the liver of these were most marked during the second, third and fourth week of their life, and varied from moderate hydropic degeneration to extensive necrotic changes of the parenchyma. In these animals where the hydropic degeneration was extensive it was always associated with some degree of fatty change and necrosis usually of a few cells in the central zone. The cells either appeared foamy or as unstained empty vacuoles with centrally or peripherally placed nuclei depending on the degree of degeneration. The nuclei were opaque, and deeply basophilic, or were shrunken and pyknotic. The peri-

pheral zone of cells in most cases were healthy and well stained. In those cases where the necrosis was the more prominent feature, three zones were usually made out in the lobule. A central zone of cells undergoing necrotic changes which extended outward probably along the course of the sublobular vein to the adjacent lobules. The cytoplasm of the cells in this area were homogeneous and stained pink with eosin. The nuclei were seen to be in various stages of degeneration. Frozen sections stained with Sudan III showed a fine dispersion of fat globules in this area. The intermediate zone consisted of a layer of single cells which were markedly hydropic. Peripheral zone of healthy cells were distributed chiefly around the portal tracts, and were stained a normal bluish pink. In the portal tracts the vein, artery, and bile duct were unaffected.

The litter of the animal No. 19 which had 0·5 gm. of marmite thrice a week along with the basic diet showed the same retardation of growth as seen in the previous set of litters; but the changes in the liver were slightly different. In the second and third week hydropic degeneration of the cells was the outstanding feature in the liver; but in the third and fourth week the appearance of the section was that of a pre-cirrhotic liver. There was collapse and condensation of the reticulum of the central zone with proliferation of fibroblasts radiating outwards along the course of the sublobular vein to the adjacent lobules. In sections stained with Heidenhain's azan stain a few bands of collagenised fibrous tissue were seen in the fibroblastic extension. The parenchymal cells, except for a narrow zone around the portal canal showed varying degrees of hydropic change. There was a slight cellular increase in portal tracts.

The litters of the two animals No. 33 and 79 which were fed on basic diet supplemented with 3 gms. of meat thrived well and the average gain in weight did not lag far behind the controls in the animal No. 79 whose ration of meat was continued. Whereas in the case of the second animal No. 33, where the meat was discontinued on the 16th day there was a definite retardation subsequently in the weight of the litter.

The histological picture of the livers in the two litters was similar in appearance during the first two weeks. There was slight fatty change in the cells of the central and midzonal regions but the nuclei were well stained and there was no evidence of serious liver damage. The wall of the radicles of the hepatic vein was relaxed. The portal veins were distended with red cells, but the sinusoids were collapsed and empty. There was no apparent proliferation of Kupffer's cells. In the third and fourth weeks the litter of the animal No. 79, which had meat in its diet, continued to show the same changes in the liver while the litter of the animal No. 33, which was deprived of the supplementary meat after the 16th day showed extensive hydropic and fatty degeneration of the parenchymal cells of the liver involving the whole lobule leaving only islands of unaffected liver cells at the periphery around the portal tracts. There was some collapse of liver cells and condensation of the reticulum into irregularly radiating bands which spread out from the centre; but there was no evidence of collagenisation of the reticulum fibres. The cells near the portal tracts showed mitotic figures, and a few were binucleated.

The litter of the rat No. 81 which was fed with 3 gms. of casein in addition to the basic diet showed a moderate gain in weight each week. The liver of the young during the first week was markedly hydropic in the central and midzonal regions of the lobules, which overshadowed the fatty change that was present in some cells. Numerous foci of haemopoiesis were

CONTROL ANIMALS ON SPECIAL DIET

Animal No.	Diet: Gestation	Diet: Lactation	No. of litter	Age of litter when killed (in days)	Wt. of litter in gms.	Degenerative changes in the liver
		Basic diet	37/I	20	10	..
37	Normal	+ 1gm. yeast	37/II	20	9·8	..
			37/III	36	14·3	..
			45/I	13	12·5	..
		Basic diet	45/II	13	11·5	..
45	Normal	+2·5gm. yeast	45/III	23	22·2	..
			45/IV	30	25·8	..

The normal weights of livers have been estimated from Table I. HATAI—*American Journal of Anatomy* 13. 1913.

distributed throughout the substance of the liver, but these were not affected. The parenchymal cells at the periphery were free from these changes; In the third and fourth weeks the liver damage was much less in evidence. There was no hydropic degeneration but numerous fine globules of fat were seen to be widely dispersed in the cells throughout the lobules. There was no necrosis, or signs or regeneration of liver cells.

Effect on the parent—There was a gradual decline in the body weight of all the experimental animals; but in no case did the injections cause the death of the animal. The liver damage varied slightly in individual cases. Microscopically the change frequently seen was moderate fatty degeneration of the parenchymal cells either central or diffuse in distribution. Very rarely a few liver cells in the centre of the lobule had undergone necrosis, with subsequent proliferation of histiocytes and fibroblasts limited to the affected region. There was no increase of fibrous tissue in any of the livers. The portal tracts showed no cellular infiltration and the cells in the outer and midzone of the lobule were healthy.

SUMMARY

(1) The effect on the liver of sucklings whose mothers were fed on polished rice and vitamins supplemented with either yeast, meat or casein and subjected at the same time to the action of carbon tetrachloride were studied.

(2) Extensive necrosis and hydropic degeneration were observed in the livers of the sucklings whose

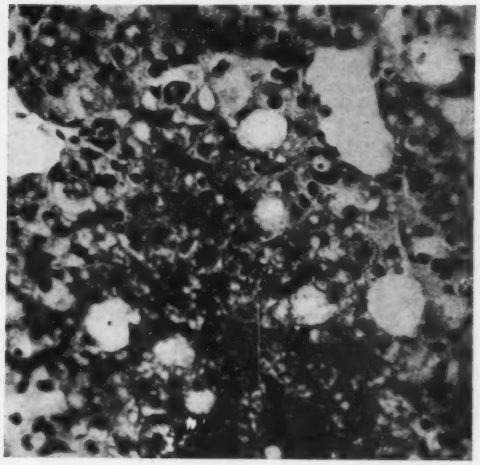


FIG. 9—Liver of litter 83/II aged 6 days whose mother was fed on the basic diet supplemented with 3 grams of casein during the experiment. The cells show marked hydropic degeneration and fatty change in the central and midzonal regions.

H. and E × 350.

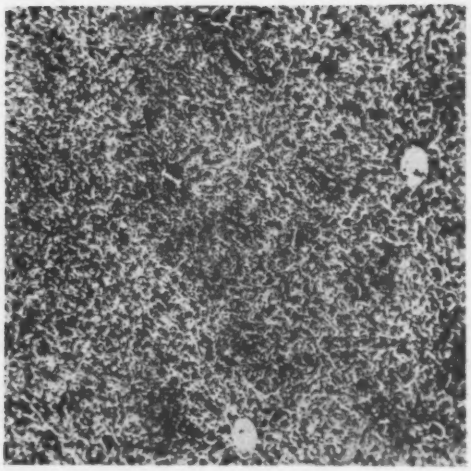
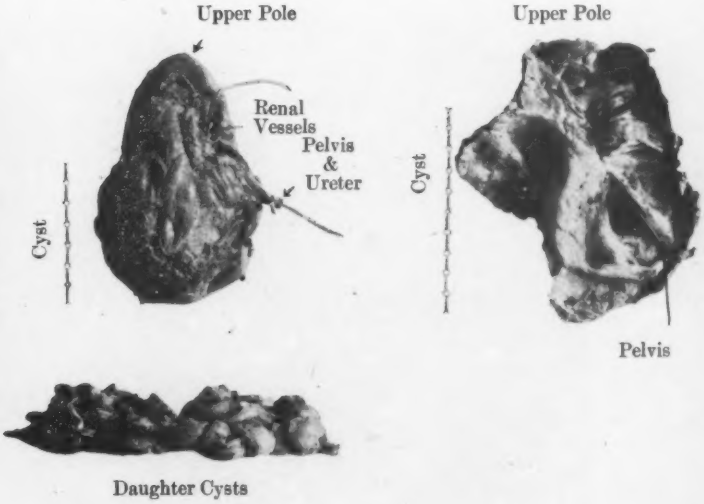


FIG. 10—Liver of litter 83/VI when it was 22 days old. The degenerative changes are less intense. Moderate but diffuse fatty change is seen in all the liver cells. There is no hydropic degeneration or necrosis.

H. and E × 75.

SUNDARESON—*Infantile Cirrhosis of the Liver.*

Skiagram of the Lumbar Region.
R—Dense opacity. S—Rarefied area.



Photographs showing details of the Cyst.

SOM—*Hydatid Cyst of the Kidney.*

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Skiagram showing multiple cysts of the lungs—two on the right and one on the left.

Skiagram of the same case (2 months later) after withdrawal of fluid from the right upper cyst.

TABLE SHOWING EXPERIMENTAL PRODUCTION OF LIVER DAMGE IN SUCKLING RATS WHOSE PARENT IS FED ON POLISHED RICE AND VITAMINS AND IS SUBJECTED AT THE SAME TIME TO THE ACTION OF CARBON-TETRA-CHLORIDE

	Diet			*Dose in c.c.*					
Animal	*Gestation*	*Lactation*	*Day of gestation when injection was started*	*Gestation*	*Lactation*	*No. of litter*	*Age of litter when sacrificed (in days)*	*Weight of litter in gms.*	*Degenerative changes on the liver*
11	Normal	Basic diet +1gm. yeast	19	0·2 c.c. Total dose	0·2 c.c. twice a week	II/I II/II II/III II/IV II/V II/VI	0 0 28 28 40 40	4·5 5·2 20·05 19·04 27·2 22	++ ++ +++ +++ + +
17	Normal	Basic diet +1gm. yeast	3	0·6 c.c. Total dose	0·2 c.c. twice a week	17/I 17/II 17/III 17/IV 17/V 17/VI	24 24 29 29 30 30	10·2 12·4 12 11·2 10·2 11·5	++ +++ +++ +++ +++ +++
18	Normal	Basic diet +½gm. marmite thrice weekly	13	0·3 c.c. Total dose	0·2 c.c. twice a week	18/I 18/IV 18/V 18/VI 18/VII	8 22 22 29 29	6·9 10·4 11·6 15·5 14	+ +++ +++ ++++
19	Normal	Basic diet +2gm. yeast	11	0·4 c.c. Total dose	0·2 c.c. twice a week	19/I 19/II	21 27	19·5 20·2	+ +
20	Normal	Basic diet +2 gm. yeast for 10 days.	11	0·45 c.c. Total dose	0·2 c.c. twice weekly	20/I 20/II 20/III	23 23 23	8·1 6·5 6·3	++++ ++++ ++++
21	Normal	Basic diet +1 gm. yeast	12	0·4 c.c. Total dose	0·2 c.c. twice weekly	21/I 21/II	0 0	4·2 3·6	++ ++
30	Normal	Basic diet +2·5 gm. yeast	15	0·45 c.c. Total dose	0·2 c.c. twice weekly	30/I 30/II 30/III 30/IV 30/V 30/VI	17 17 24 24 31 31	11·8 11·7 12·5 19·8 17·5 16·5	++ ++ ++ ++ + +
33	Normal	Basic diet +3 gm. meat per day for 16 days.	15	0·4 c.c. Total dose	0·2 c.c. twice weekly	33/I 33/II 33/III 33/IV 33/VI	16 16 23 23 34	10·5 11·8 10·8 10·2 12	+ + ++++ +++ ++
39	Normal	Basic diet +1 gm. yeast	14	0·4 c.c. Total dose	0·2 c.c. twice weekly	39/I 39/II	19 26	5·5 7·8	+++ +++
44	Normal	Basic diet +1 gm. yeast	11	0·4 c.c. Total dose	0·2 c.c. twice weekly	44/I	15	4·4	+++
79	Normal	Basic diet +3 gm. meat	10	0·4 c.c. Total dose	0·2 c.c. twice weekly	79/I 79/II 79/III 79/IV	8 8 24 24	13·6 13·2 30·8 31·2	+ + + +
83	Normal	Basic diet +3 gm. casein	14	0·4 c.c. Total dose	0·2 c.c. thrice weekly	83/I 83/II 83/III 83/IV 83/V 83/VI	6 6 15 15 22 22	10·3 10·3 12·3 12·6 21·5 21·2	+ + ++ ++ + +

mothers were partially deprived of either yeast or meat in the diet. The general effect on the animals was a striking retardation of their growth.

(3) Even on the fifth week the young were not completely weaned, and the livers continued to show degenerative changes.

(4) The greater the amount of yeast, meat, or casein in the diet of the mothers, the less the degenerative changes observed in the livers of the sucklings. Of these three diets, casein had the least protective action.

ACKNOWLEDGMENT

The author desires to thank Professor A. Murray Drennan for the advice and guidance he gave in this work, and Professor D. Govinda Reddy for his helpful criticism.

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ADVANCES IN CATARACT OPERATION

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In India cataract is one of the commonest diseases of the eye, especially in old age. It is said that there are six hundred thousand of cataract cases in India, and that one hundred thousand operations on cataract are performed every year. Thus, there remains a balance of five hundred thousand cataract patients who bid their time in partial blindness which is radically curable by operation. Hence, every medical practitioner, must have particular knowledge of cataract and the various methods of operation.

At the very dawn of civilization, India did lead the world in 'classical' method of cataract operation, known as 'couching operation' of the cataractous lens. This consisted in couching the cataractous lens in its capsule, and pushing it deeply into the vitreous gel. The cataractous lens was thus removed from the region, and no more remained as an obstruction to vision which became quite clear.

Smith[1] wrote "Lens couching has been practised in the East from time immemorial. It is the parent of all modern operations on cataract, and alone deserves the name 'classical'. History no more relates its origin than that of the practice which was the parent of all modern vaccination, the inoculation of a healthy individual with the juice from the pustule of a small-pox patient with the object of provoking a mild attack of the disease, which would give subsequent immunity to it. Both were important observations in their time. Both were given by the East to the West".

One wonders when did classical lens couching operation originate in the East? How was it given to the West by the East? If history does not relate its origin, how far near its origin does it relate? Are there any authentic records of the facts? Yes.

Let Duke-Elder[2] answer:—"The history of cataract is long, and extends backwards at least three thousand years, and probably further. The earliest authentic record which has been traced, is a treatise on surgery, written some thousands of years before Christ by the great surgeon of ancient India, Susruta, a pupil of Dhanwantari, the Father of Indian Medicine. He was the first to practise and teach the principles of surgery. Long before Hippocratic era, he taught the foundations of surgery based on anatomical dissections, he practised aseptic surgery (advising that the operating room be fumigated with sweet vapours, and that the surgeon keep his hair and beard short, his nails and hands clean, and wear a sweet smelling dress), and apparently used some kind of inhalation anæsthetic. In the wealth of his teachings on general surgery, he dealt systematically and elaborately with the anatomy, physiology, and pathology of the eye, and he described in accurate and beautiful detail the different varieties of cataract, giving an admirable account of the technique of its treatment by couching, and the postopertive care which he successfully practised. It would seem obvious that this extremely advanced account was preceded by previous knowledge and experience in the rich civilization of early Hindusthan."

The treatise on surgery referred to above is called 'Susruta Sanhita'. In the chapter on ophthalmology, the opacity of the lens and its treatment by the classical lens couching method[3] has been described.

von Esser, M.A.A.,[4] a famous ophthalmic surgeon of Germany gave Susruta the honour which was his due as the father of cataract operations.

Dutt, K.C.,[5] focussed the light of modern ophthalmology which scientifically intensified Susruta's glory.

The knowledge of couching operation extended from India to Arabia. The Caliphs of Bagdad called many learned men from India and Arabia to Bagdad and translated 'Susruta Sanhita' into Arabic. The Arabic translation was named 'Ketab-a-Susrud'. Arabian surgeons thereafter extensively practised lens couching operation, and some of them introduced modifications in the technique. From Arabia the knowledge passed over to Babylon and Egypt and to Greece and Rome, and thence throughout the whole of Europe. Till the middle of the eighteenth century, lens couching was the only method of operation for

cataract, and was extensively practised in Europe, Asia and Africa.

But, there was one shortcoming of the operation. The result of lens couching operation was not permanent. Moreover, in many cases after a few years the couched lens floated up upon the vitreous to its original position behind the pupil, and thereby again obstructed sight.

It was, therefore, deemed necessary to devise operations in which the cornea was opened, and the cataractous lens was extracted through the opening. With the discovery of local anaesthetics and antiseptics, open methods of operation became quite practicable and free from the risk of septic infection.

There are two varieties of cataract extraction. One is called extracapsular, in which the anterior capsule of the cataractous lens is cut, and the nucleus and a large quantity of cortical matter of the lens are extracted. The other is called intracapsular, in which the cataractous lens within its capsule entire is extracted without cutting the anterior capsule.

The extracapsular method of cataract extraction was inaugurated by Daviel[6] of Paris in 1753. In the capsulotomy method, after sclerocorneal incision, the anterior capsule of the cataractous lens is cut with the cystitome. The nucleus of the lens and a large amount of cortical matter are expressed out by the lens expressor, and also washed out if necessary. But the posterior capsule, the cut anterior capsule, and the remaining portion of the cortical matter which sticks to the capsule, are left behind in the posterior chamber. Part of the cortical matter, however, becomes opaque and thus there is after-cataract formation. In all the cases in which the after-cataract becomes thick and obstructs vision to an appreciable extent, needling operation, or discission operation becomes necessary in order to cut a hole in the after-cataract through which light may pass to the retina without obstruction. Sometimes needling operation may have to be repeated if the passage made by needling closes up. The after-cataract formation is a great drawback to the capsulotomy method of cataract extraction, because the consequent obstruction to vision in many cases urgently requires needling operation.

Moreover, needling operation is not always a harmless operation especially if it has to be repeated. Fisher[7] of U.S.A. voiced the opinion of experienced surgeons thus:—"Needling operations are considered by many as being quite dangerous always leaving a hernia of the vitreous, and are often followed by post-operative inflammations, and too often by inflammation with great danger of serious loss of vision."

Smith[8] stated: "For the surgeon who extracts cataracts by capsulotomy is now-a-days forced by pressure of competition to extend his sphere of action to the immature stage. The density and toughness of the after-cataract which ensues, drive him to needle it while it is still young and tender, before the eye has lost its intolerance to further operative interference and has recovered a stable equilibrium." Hence "sudden disasters which frequently destroy the eye" follow.

Duke-Elder[9] reminded us,—"It is well-known that after extracapsular extraction of cataract especially when a considerable quantity of lens material is left in the eye, an iritis sometimes of considerable severity is commonplace. The theory that the reaction in the eye is due to an anaphylactic reaction to the lens protein is already known from the work of Burky and Woods[10].

The anaphylactic reaction due to the presence of retained cortical matters which follows capsulotomy operation, may also follow needling operation in a severe form. When needling is repeated, it may give rise to endophthalmitis-phaco-anaphylactica due to disintegration of lens protein which acts as a toxin. On the whole, it is clear that iritis and after-cataracts are common after capsulotomy, and that needling operations are not free from risk.

In India few patients can afford to spend the money and make the necessary arrangements to appear for the needling operation. This is especially difficult for the moffusil patients, who come to the town for the purpose of cataract operation from distant villages. Besides many patients prefer to remain in partial blindness than to run the risk of needling operation. This is not to be wondered at, when we take into consideration the frail body and mind of our old cataract patients, especially those of a nervous temperament. It follows that if five per cent of the operated appear for the needling operation, there may be fifty-five per cent more who either cannot afford to spend the money, or may not like to run the risk of needling operation.

Moreover, extracapsular operation is neither applicable to all the varieties of cataract, nor in all the stages of maturity of the cataract. If an immature cataract is operated by the capsulotomy method, a large amount of cortical matter sticks to the capsule, and cannot be washed out, or expressed out. The after-cataract that forms is too thick and tough to be dealt with by needling operation. If the after-cataract is dealt with by needling before the anaphylactic reaction in the eye is over, sudden disaster may happen due to endophthalmitis-phaco-anaphylactica. Therefore, only after the cataract is fully mature can capsulotomy operation be performed. Again in subcapsular cataracts, the sticky cortical matter adheres to the capsule even after irrigation and expression. Hence vision cannot be quite clear after capsulotomy operation. In cases of hard cataracts with thick sclerosed nucleus and little cortical matter, the capsule cannot be easily cut by the cystitome. Therefore, capsulotomy operation is suitable only in the mature stage of selected cataract cases, and not universally applicable to all sorts of cataracts in all the stages of their maturity.

Owing to all these drawbacks and shortcomings of the capsulotomy extraction, it was found necessary to inaugurate methods of intracapsular extraction in which the cataract was extracted in its capsule entire. After intracapsular extraction nothing was left behind in the posterior chamber which could organise into an after-cataract, or, could irritate the iris and set in an anaphylactic reaction in the eye.

The intracapsular extraction has been called in some text books on ophthalmology as the ideal operation and has not been dealt with in detail. But the

ideal must be attained, because the eye is the most precious thing. Anything short of the ideal is not to be aimed at in cataract operation. Now that with the inauguration of the lever action intracapsular method, the ideal has been rendered practical and practicable on all varieties of cataract, in all the stages of maturity without any drawback and shortcoming, it will be interesting to review in some detail the gradual advice in the technique of intracapsular methods of cataract extraction.

McNamara[12] of the Calcutta Medical College inaugurated the intracapsular method of extraction by pressure of the hand, and published the same in 1868. Smith[13] popularised the pressure methods in the Punjab, hence called Smith's pressure method. Smith substituted the lens hook for the hand, and published his paper in 1904.

In this method after sclerocorneal incision of the limbal arc, pressure was applied with the lens-hook at 6 o'clock of the corneal dial below the limbus so as to raise the pressure of the vitreous and thereby to dislocate the lens-in-capsule. After the dislocation of the lens in its capsule, the cataract was delivered either upright, or with the lower edge foremost, as the case might have been. Many ophthalmic surgeons of the Punjab, N.W.F.P., Sind, and other provinces practise the pressure method. The great drawback of this method is that in some cases vitreous is pressed out along with the cataractous lens. The amount of pressure required to dislocate the cataract varies very much in different cases. Hence it is difficult to forejudge and to apply the exact amount of pressure with the lens hook.

Barraquer[14] of Barcelona inaugurated the vacuum suction method of extracapsular extraction, known as phaco-eresis in 1917. Barraquer devised an electrical suction instrument named eresiphake which has got a cup of the size of a cataractous lens. In this method after a sclerocorneal section the vacuum suction cup of the eresiphake was set upon the anterior surface of the cataractous lens, and then the eresiphake was electrically worked. The cataractous lens in its capsule was sucked up with the vacuum suction cup under negative pressure, and extracted with the boat-gliding movement.

There is a great drawback of this vacuum suction method, *viz.*, in some cases vitreous was sucked out along with the cataractous lens in its capsule.

Finding both the above mentioned methods too risky, A. S. and L. D. Green[15] devised a combination of Smith's pressure and Barraquer's vacuum suction intracapsular methods, in the hope of minimising the risk of pressing out the vitreous in Barraquer's vacuum suction method. In this combination method after sclerocorneal incision, the vacuum suction cup of the eresiphake was adjusted on the anterior surface of the lens in its capsule, and vacuum suction was made by electric power, at the same time pressure was applied from outside with the lens hook at 6 o'clock of the corneal dial to help the dislocation of the cataractous lens safely without excessive amount of suction and pressure. By this combination of vacuum suction and pressure, vitreous loss was diminished to a certain extent, but still in some cases vitreous loss occurred.

Knapp[16], Torok[17], Elschnig[18], Vernoeff[19], Stanculeaunu[20], Sinclair[21] introduced the combined method of capsule forceps of traction with pressure from the outside. Capsule forceps of various designs were devised to hold the capsule and apply traction. After sclerocorneal section the capsule forceps was used to get hold of the anterior capsule of the cataractous lens. Lateral traction from side to side was applied with the capsule forceps. The cataractous lens was thereby subluxated. Pressure was then applied from the surface of the sclera at 6 o'clock corneal dial to aid dislocation and delivery of the lens-in-capsule, while the lens capsule was still held with the capsule-forceps and moderate traction was applied forward and upward. By this manœuvre delivery of the lens-in-capsule was effected.

By this combined method of forceps traction with pressure vitreous loss was diminished, but rupture of the capsule occurred in many cases. This is a drawback of this combined method.

Lopez Lacarrere[22] inaugurated the diathermic needle traction method of intracapsular extraction. Lacarrere invented the electro-diaphakie for this operation. After sclerocorneal section, the diathermic needle of the electrodiaphakie was pushed into the cataractous lens in its capsule coagulated firmly on the diathermic needle which had notches to hold on the coagulum. Traction was applied, and the lens in its capsule was extracted in coagulated hard condition.

The great drawback of this method was the accidental coagulation of the vitreous along with the cataractous lens in some cases. This drawback rendered this method risky.

Some advocates of the capsulotomy (extracapsular) method contended that owing to the removal of the posterior capsule by the intracapsular method, the vitreous underwent degeneration and became opaque, and that there were glaucoma and detachment of the retina after intracapsular extraction of cataract.

Many eminent ophthalmologists, thereupon, took especial care in investigating and following up hundreds of unselected cases of intracapsular extraction in order to arrive at the truth of the allegations stated above.

One should thank Lister[23] (1906) Greene (1909)[24], Green and Millet (1912)[25], Fisher (1915)[26], Meding (1917)[27], Hallet (1920)[28], Pratt (1921)[29], Kirapp (1925)[30], Elschnig (1931)[31] and others for taking much pains in following up cases operated by Smith's pressure method, and Knapp-Torok-Elschnig's forceps traction *cum* pressure method. Their findings were that the end results of intracapsular extraction were free from glaucoma and detachment of the retina, and that the vitreous did not undergo opacification, or any other degenerative change.

Thanks are also due to Vail (1915-16)[32], Fisher (1910-1917)[33], A. S. and L. D. Green (1917-22)[34], Urra (1921)[35], Wright (1924)[36], Cruickshank (1925)[37], Saint-Martin (1929)[38], Cadilhac (1930)[39] and others for carefully observing and investigating cases of intracapsular extraction by Barraquer's

vacuum suction method and combined pressure *cum* vacuum suction method of A.S. and L.D. Green. The results of their investigation proved that the immediate and final results of intracapsular extraction were better and free from complications of opacity of the vitrous gel, and of detachment of the retina, or of glaucoma, as alleged.

The unanimous and impartial verdict of the renowned investigators that after intracapsular extractions there were fewer complications than after capsulotomy (extracapsular) operations, and that the vitreous and the retina did not undergo any degeneration or pathological alteration at a later date due to removal of the posterior capsule, set at rest the agitations and allegations against intracapsular methods of cataract extraction. These truth seekers have done a great service to suffering humanity by removing the prejudices and apprehensions against intracapsular methods of cataract extractions.

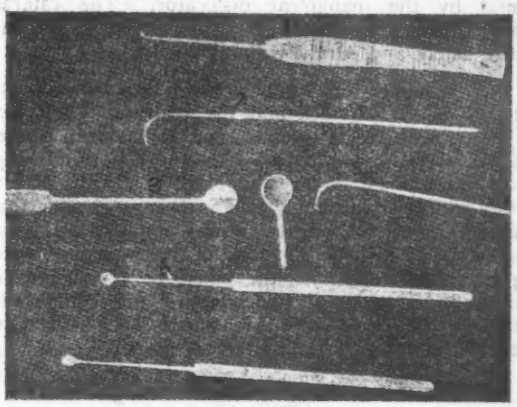
Fisher of U.S.A.[40] voiced the world opinion thus,— "The intracapsular operation for senile cataract is becoming daily more popular, and operators are looking for a method whereby vitreous loss and rupture of the capsule together with the other complications due to these accidents will be reduced to a minimum."

In answer to the call of operators looking for a safe and sure method of intracapsular extraction free from the risks of loss of vitreous and rupture of the capsule, the lever action intracapsular method has been inaugurated by Dutt[41] in the same Hindusthan which gave birth to the classical method of cataract operation in prehistoric age. In Dutt's lever action intracapsular method, the root causes of vitreous loss *viz.*, the application of pressure and of vacuum suction, or a combination of these two, have been eliminated from the technique, thereby the risk of vitreous loss has also been eliminated. Similarly, the root causes of the rupture of the capsule, *viz.*, the holding of the capsule, with the capsule forceps and applying traction on the capsule, or, combining pessure and capsule traction, have been eliminated from the technique, thereby the risk of rupture of the capsule has also been eliminated.

Dutt's method is quite original and new. It has an infallible scientific basis and is governed by the laws of lever action of statics and dynamics. This method is fundamentally different from all other methods intracapsular or extracapsular.

Dutt has invented two silver instruments, *viz.*, the hyalo-navicular fulcrum and the mangoleaf dislocator. A photographic reproduction of the two instruments is herein given. With these two instruments, the one forming the fulcrum and the other serving for the application of the power or effort, both acting from the outside of the eyeball, the dislocation rotation and delivery of the lens in its capsule is enacted by lever action mechanism.

The scientific principle of lever action has been taken advantage of ever since the time of Archemedes 300 B.C. to perform works of great resistance, or to lift heavy weights with the expenditure of a minimum of power or effort. In statics and dynamics[42] and in mechanics[43], a lever has been described as a rigid bar, or rod, straight or curved, which is capable of turning freely about a fixed point of support. The point of support is called the fulcrum. The effort or power is a force applied at any point of the lever so as to turn it about the fulcrum, and thus to overcome



DUTT'S MANGOLEAF DISLOCATOR: 1. Front view. 2 & 5. Side views. DUTT'S HYALONAVICULAR FULCRUM: 3 & 7. Navicular face. 4 & 6. Hyaloid face

a resistance, or to raise a weight attached at any other point of the lever. By lever action a small effort or power can be used to overcome a great resistance.

In lever action intracapsular operation, after making an outlet sufficient for the cataractous lens in its capsule to be delivered, by performing an incision through the upper half of the limbal arc with the cataract knife, the hyalonavicular fulcrum is held by the left hand, and the mangoleaf dislocator with the right hand of the operator. The navicular face of the hyalonavicular fulcrum is applied at XII o'clock of the corneal dial. The uppermost edge of the equator of the lens-in-capsule is socketed in the navicular fulcrum with the sclera intervening as a pad. The uppermost edge of the equator of the lens-in-capsule can thus freely turn about the fixed point of support inside the navicular fulcrum, as if within a hinge.

The lens-in-capsule which has become more or less rigid owing to cataract formation, acts as a curved rigid bar in the mechanism of lever action. The effort or power is applied at the diametrically opposite point, *i.e.*, the lowermost edge of the equator of the lens-in-capsule at VI o'clock of the corneal dial. The effort is applied by the tip of the mangoleaf dislocator from behind forwards away from the vitreous. The convexity of the uppermost edge of the equator of the lens-in-capsule freely turns with each effort, about the fixed point of support inside the concavity of the navicular fulcrum forming a ball and socket mechanism. The resistance to be overcome is formed by the zonular attachment to the cataractous lens. With each delicate application of the power or effort, the zonular resistance gives way from below upwards, and the lowermost edge of the equator of the lens-in-capsule gradually rotates from below upwards. When the lowermost edge has rotated 90° degrees, and has

thereby put its nose into the incised outlet, the hyaloid face of the hyalonavicular fulcrum is substituted for the navicular. The anterior surface of the lens-in-capsule is now socketed inside the hyaloid fulcrum. The posterior surface of the lens-in-capsule is hooked round by the mangoleaf dislocator. The cataract being thus securely held is delivered in its capsule entire safely and surely without any risk.

By placing the zonular resistance between the fulcrum at XII o'clock and the effort at VI o'clock of the corneal dial, a lever of class II has been formed in the scientific mechanism of lever action intracapsular extraction. A lever of class II always acts at a mechanical advantage which is always greater than unity, *i.e.* than the original power employed. Hence, non-violence[44] is the keynote of lever action intracapsular operation, and the cause of its success in thousands of cases of undermature and complicated cataracts of all varieties. Archemedes once said "Give me a fulcrum and I can rotate the Earth".

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THE THERAPEUTIC VALUE OF CUPRAMMONIUM COMPOUNDS

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The elements of the first B sub-group of the periodic classification are well known for their use in medical preparations. The value of the compounds of silver in medicine is known since the early days. Silver nitrate is used as an astringent and a mild caustic and the aqueous solution has been used for eye lotions and in other preparations. Even metallic silver in the colloidal form is administered in the form of injections, in venereal diseases. Colloidal gold is used in tuberculosis as an injection. Thus it is natural to expect that copper, another member of the first B sub-group, should also have an important therapeutic value.

Being engaged in the study of the compositions of various ammino compounds of copper, for the past several years, I have observed, that a number of ammonia compounds, quite distinct from each other, are capable of existence. I have found, that tetra-, penta- and hexa- ammonia compounds of copper exist in the case of the sulphate (Dey and Bhattacharya, 1945), whereas the tri- ammonia compound is existent in addition to the aforesaid compounds in the case of the chloride (Dey, 1946) and the nitrate (Dey, 1946a) of copper. In the present communication, I propose to record, some of the therapeutical properties of cupric sulphate and its complex compounds, with a view to attract the attention of medical research workers to this direction. I feel, that the cupric ammonia compounds will prove of great medicinal value, and that the different ammonia compounds will have specific properties, characteristic to themselves.

Cupric sulphate is well known as an astringent, being administered in doses of 0·016 to 0·12 grammes; when used as an emetic its maximum dose is 1 gramme. Cupric sulphate is irritant to the nerve endings in the stomach which gives rise to vomiting reflex and thus has rather an emetic action. It is also used on mucus membranes as an astringent and caustic. It has a relatively high toxicity for fungi, protozoa and algæ, but is not a reliable bactericide. Its absorption is low and hence the toxicity is also low.

Now, if we have a complex compound, which would liberate cupric ions very slowly, its use against fungus infections *in vivo* would be of value. For similar reasons such a compound would be valuable in the dressing of wounds, in the touching of open wounds, where it would expose new surface and start epithelisation, provided the decomposition is so slow, that the tissues might not be damaged.

Traces of copper aid greatly as a supplement to iron in the formation of hæmoglobin in nutritional anæmia. Hence larger molecules of cupric compounds, with a low content of copper, are apt to prove useful in cases of anæmia. Copper and antimony compounds have also been used in leprosy cases but in stationary cases they have no effect.

Like a large number of chemicals, very little is known, about the therapeutic value of cuprammonium salts. It is likely, that due to the excess of hydrochloric acid present in the stomach, the ammonia of the compound should get neutralised, and the properties of the cupric ion should be predominant; it is well known, that cupric salts of ammonia have their effect due to the cupric ion only. But it can safely be used in the form of injections or for external applications, without the properties of the ammonia complex being destroyed. Since ammonia is also astringent, the co-ordination with copper, which has itself got astringent properties, is likely to bestow the cuprammonium compounds with more astringence. Very few references, however, are on record, regarding the use of the cuprammonia solution in medicine. Cignoli (1936) and Del Carlo and Paternosto (1934) have described methods for preparing ammoniacal solutions of cupric sulphate for use in medicine. Nitsen (1937) claims that cupric compounds produce very definite improvements in helminthic infections. Preliminary observations were made with 4 per cent of ammoniacal copper sulphate, which was given intravenously to intestinal schistosomiasis cases, in doses of 5 to 10 c.c. Thus it is likely that further researches on the chemotherapy of cuprammonium salt solutions may prove fruitful.

I thank Dr. B. K. Malviya of King George's Medical College, Lucknow, for supplying me valuable information on this subject.

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MATERNITY SERVICE SCHEME

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MATERNITY FIGURES

	India	*Bengal*	*A district of Bengal (Jessore)*
Population ..	40 crores.	6 crores	20 lacs
Birth rate 30 per thousand ..	1·2 crores	18 lacs	60,000
Maternal mortality @20 per thousand birth ..	2·4 lacs	36,000	1,200
Infant mortality @162 per thousand birth ..	19·4 lacs	3 lacs	10,800 @ 180 per thousand

BENGAL

60 million (urban 6 million, rural 54 million)

	Average population per unit	*Average number of confinements*
Division 5 ..	12,000,000	18 lacs (rural 16 lacs; urban 2 lacs)
District—28 (4-5 Sub-divisions) ..	2,100,000	60,000
Sub-Divisions—84 7-8 Thanas) ..	700,000	20,000
Thana—628 (8 Union Boards) ..	90,000	2,400
Union Boards—5000 (17 villages) ..	12,000	300
Villages—84,000 ..	700	..

It is the authoritative opinion that 50 per cent of deaths are due to inefficient and meddlesome midwifery. Thorough antenatal care and skilful attendance at labour by experts will certainly reduce this enormous maternal and infant mortality to the minimum.

The Scheme is divided into 2 parts:

A. Administrative.

B. Operational.

The Central Board will be purely administrative. It will be constituted by the heads of Provincial Organisations and such other experts (medical and non-medical) whose services will be of special value.

Function:—(a) To work out the plans of national maternity service, which will be suitable all over India.

(*b*) To co-ordinate the works of different provinces.

(*c*) To prepare sample record sheets which will be introduced throughout the whole of India. Headings in the chart will be printed in provincial languages but English and Hindusthani substitutes are to be put in brackets under each heading. Record sheets

are to be made in such a way that they will be utilised for proper assessment statistically. Thus valuable information will be available and this will form a nucleus for extensive research and study.

The Provincial Organisation will be both administrative and Special Operational. The main function will be to control and co-ordinate the work of different districts, to give guidance to district organisations, to arrange an annual conference of all the organisations of the districts. They will run Special Maternity and Gynaecological hospitals mainly for research and complicated operations requiring special knowledge and experience.

District organisation would be a 50-bedded first class maternity hospital. It should be of such status and repute that it would be the consultative, teaching and research centre of the whole district as well as the source of inspiration and leadership for all the workers in the service whether specialists, general practitioners, midwives, nurses or lay workers. The head of this hospital would be one of professional status and should be of such an outstanding competency as to mould all the different centres from the Union Board to the district into one complete, co-ordinated and integrated body.

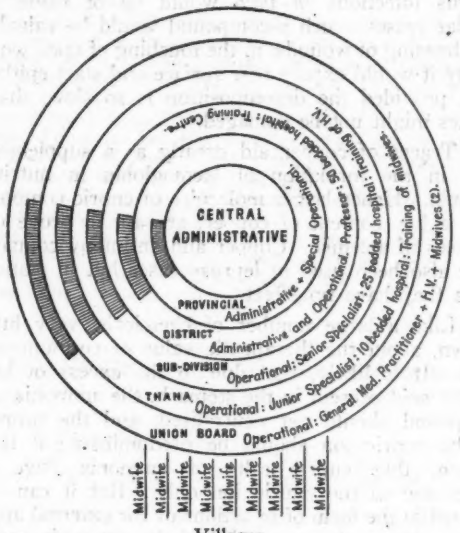
The Sub-divisional Maternity Centre would be a 25-bedded maternity hospital with highly specialised equipments and staffed by a senior specialist who would provide full range of service.

The Thana Maternity Centre would be a 10-bedded fully-equipped maternity hospital under one junior specialist and the requisite staff. It would provide accommodation for booked cases as well as for complicated and emergency ones sent in from outside. They would provide consultant services for general practitioners and give guidance to registered midwives and health visitors in antenatal work and domiciliary midwifery practice. One of the main functions will be to train midwives.

The Union Board Maternity Centres would be small units in charge of selected general medical practitioners of the locality and would have two registered midwives and one health visitor under him. They would have a 5-bedded maternity hospital for local women who wished to have institutional confinements and for emergency case for which a more distant journey would be dangerous. They would be in close touch with the nearest Thana Maternity Centre from where the specialist staff would come for consultations and operations.

Practical Working out of the Scheme

The work can be started either from the Central Organisation and following each sub-section in a step down manner upto the Union Board Organisation, or from below up with the help of a Central Administrative Body. After mature deliberation, I find it would be more effective and practical to set up an All-India Central Administrative Board, as well as one Provincial Administrative Board in each province and then to start the work immediately in the Thana Centres instead of Union Board ones. My proposition of not starting the work immediately at the Union Boards are: (1) there are about 160 Union Boards in a district having on an average 300 confinement cases annually in each (2) necessary personnel for so many centres will not be available at present, (3) better and more efficient service may be given if the more difficult cases be pooled in a more central place where it will be possible to have an expert to deal with the same. That is why a Thana Centre is preferred, under which there will be on an average 2400 confinement cases per annum *i.e.* about 200 to 250 cases a month. It has been calculated that if a Thana Centre is situated



A Diagrammatic Representation of Maternity Service Scheme

near about the middle part, a patient may be brought into the hospital within 2 to 3 hours even from the most distant corner. Provided the transport facilities are bettered, a patient may be brought in much earlier. Further reasons of my advocating Thana Centres is that at present we have scarcely a group of trained personnel who can take up the work either at the District Head Quarters or even at the Sub-divisions. Neither have we adequate number of midwives (not to speak of Health Visitors) to take up the work in Union Boards or villages. The personnel for Union Board and villages are to be created and trained by the Thana Centre Hospitals. Different maternity hospitals of the provinces may supply a few junior experts who have served these institutions for 2 years or so. Their services will be requisitioned for establishing Thana Centres. In a district there are about 20 Thanas. If they can be organised as quickly as the junior experts, health visitors and trained nurses are available, the bulk of the work of the scheme and the most difficult part of the work is done. If the health visitors are not available (which is most likely) the senior trained nurses will take up the work of health visitors and carry on for the present under the guidance of expert doctor. Later on or if possible along with the establishment of Thana Centres, some

of the Sub-divisional Centres may be taken up at hand (provided sufficient fund and personnel are available).

If 5 midwives are trained every year from each Thana Centre, in 5 years' time 25 midwives may be supplied to the Union Boards who will start functioning since then and thus in two 5-year terms, the whole of the rural areas upto Thana will be supplied with efficient maternity service.

There will be a Provincial or District Examination Board for examining midwives.

A Detailed Working Scheme for a Thana Centre

Area	100 sq. miles (minimum 36 sq. miles, maximum 226 sq. miles).
Union Board ..	8.
Villages ..	100 villages.
Population ..	1 lac.
Births ..	2400.
Transport facilities	A patient may be brought into the hospital in about 3 hours time even from peripheral areas.

Estimate of Expenditure:—

	Rs.
Capital:	
Brick-built ..	25,000/- (*vide* plans).
Pucca floor (tin or asbestos roof)	15,000/-
Equipments	5,000/-
Recurring expenses:	Rs.
Junior specialist ..	200 to 250/-
Part-time local doctor	50/-
Compounder ..	25/-
Health Visitor ..	100/-
2 midwives @ 50/- ..	100/-
7 under hands @ 20/-	140/-
1 durwan.	
2 bearers.	
2 sweepers.	
2 cooks.	
Establishment (including diet, medicines, washing etc.)	300/-
	Rs. 965/- Say 1,000/-

Source of Finance:

Local response	
Capital	Red Cross
Recurring—fees for confinement	District Boards
	Public Health Department
donations	National organisation
subscriptions	

If properly worked out, in 5 years' time each centre may be greatly self-sufficient. The whole thing is to be incorporated in the National Maternity Service Scheme. If these Centres become successful, further medical and sanitation work can be taken up in these places and arranged in the same principles as the Maternity Centres. Expenses will also be less for the combined and corporated scheme.

MORE OBSERVATIONS ON SO-CALLED PRIMARY ABDOMINAL TUBERCULOSIS

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As observed before (Misra, 1946) primary abdominal tuberculosis is very frequently diagnosed all over the country on what appears to be insufficient and often incorrect data. Despite the frequency with which this diagnosis is made, it would appear that abdominal tuberculosis is the Cinderella of modern medical literature both in this country and abroad. A very careful and painstaking survey of available American, British and Indian literature shows an almost complete absence of references on this important and so frequently diagnosed disease apart from the bibliography quoted in the above-mentioned and this paper.

A brief resume of this paper may here be given for the convenience of the readers. Abdominal tuberculosis may either be primary or secondary to tuberculous disease elsewhere, particularly lung tuberculosis. The three sub-varieties, based on careful pathological post mortem material are intestinal, glandular and peritoneal. Each has definite and clear-cut symptoms and physical signs.

Intestinal tuberculosis may be ulcerative with fever, frequent diarrhoea, abdominal tenderness, hypermotility of the bowels as seen by opaque skiagraphy, presence of T.B. in the stools by the antiformin method, a positive Triboulet and occult blood-tests, and the hyperplastic variety which has now been definitely regarded as non-tubercular, Hurst (1944). As regards the ulcerative variety, most authorities are certain that it is very seldom primary, Brown and Sampson (1930), Osler and McCrae (1930), Goldberg (1935), Amberson Jr. (1936), Shrikhande (1936) Maxwell (1936), Conybeare (1937), Tribedi (1941) and Hurst (1944).

Abdominal glandular tuberculosis chiefly affects the mesenteric and para-aortic group of glands, which are easily palpable as most of the patients have a thin abdominal wall. Except in the case of young children, the primary variety is rare, because bovine tuberculosis is rare in this country, and because milk is always boiled before being drunk.

Peritoneal tuberculosis is of three varieties, free ascitic or the loculated variety in which signs of fluid are present, and the fibrocaseous variety with palpable rolled omentum, a doughy feel and partial obstruction. The primary variety is rare, most cases being secondary to frank pulmonary or genito-urinary (in the case of women, cervical or Fallopian-tube-tuberculosis) disease.

The basic point which bears reiteration is that, unless the above classical description of abdominal tuberculosis, based on careful pathological work, is grossly incorrect, the great majority of cases that are diagnosed as primary abdominal tuberculosis are being given that label incorrectly, and are, therefore, being treated wrongly.

Symptomps And Signs

Perhaps the most common symptom in the beginning is unsatisfactory bowel evacuation. There is also some frequency of motions, because the patient feels some heaviness, flatulence and discomfort, for which he frequently takes laxatives and even purgatives which only make him feel worse after a day or so. He often reduces his diet in the vain hope of relief and often takes leafy vegetables in large quantities to improve his "constipation." He usually finds that milk does not agree with him because it produces flatulence. There may be low temperature of 99° or 99·5°F. The sum total is that he loses weight and becomes anæmic (due to nutritional deficiency), the bowels remain irregular (loose stools being produced due to the use of purgatives and a high roughage diet), and vague tenderness is present all over the abdomen—particularly round the umbilicus and the right and left iliac fossæ (over the caecum, the ascending and the descending colon). An anxiety-state is a very frequent feature in the majority of cases for obvious reasons. At this stage, if he consults an "allopath" he is labelled "abdominal tuberculosis." Women suffer from this more frequently, in whom the symptoms often date from the last childbirth. The age-incidence is from 15-40 years.

A past history of dysentery, which may have even been forgotten unless clearly asked for, is almost always given and many complain of repeated attacks of dysentery.

Careful physical examination reveals a thin and anæmic individual with temperature varying from 99°-100°F, a somewhat rapid pulse, vague tenderness over the abdomen which does not feel doughy, nor does it reveal any palpable masses, though the caecum often shows thickening while the colon may be spastic. A gurgling sensation is often elicited. Rectal examination usually shows some degree of proctitis. The lungs are free from disease (a skiagraph is always taken) and vaginal examination in the case of women reveals a healthy genital apparatus. The tongue is often inflamed and many cases show well-marked glossitis. Blood examination reveals anaemia of varying degree, at times microcytic or more often macrocytic (specially in advanced cases), while the leucocytes are usually unaltered. A microscopic examination of the stool always shows pus cells in varying numbers; at times cysts of Ent. histolytica or giardia are revealed while the search for T.B. has been given up now because it has often been found negative even in frank cases of pulmonary tuberculosis with secondary intestinal involvement. A fractional test meal reveals in many cases hypochlorhydria or even achlorhydria, while barium-meal investigation shows hypermotility and sometimes diminution of haustration of the large bowel.

Differential Diagnosis

As has been mentioned before, the alternative diagnosis suggested in these cases is chronic colitis coming on after one or more attacks of bacillary or amœbic dysentery or after the abuse of purgatives or as a part of nutritional deficiency, conditions like muco-membranous colitis, ulcerative colitis, chronic appendicitis, malignancy, sprue and pellagrinous diarrhœa have to be kept in mind and can be excluded without much difficulty.

Case Reports

Many cases have been encountered. Due to lack of space, certain selected cases are described here in brief, only the positive findings being mentioned:—

Case 1. B.P.K. 32 years. Frequent attacks of loose stools and abdominal pain for over 10 years, starting from an attack of? bacillary dysentery. Condition became much worse for 4 months. Over a stone loss in weight with anæmia and anxiety, vague tenderness present over cœcum and descending colon. Stools show pus cells in fair numbers. Skiagraphy shows hypermotility. Treatment with low pressure isotonic enemata (in which Enterovioforme was suspended) taken for six months with low roughage diet and a tonic sedative enema given up 2 months ago. Feeling all right now. No more diarrhoea, flatulent distension, abdominal pain or tenderness. Weight increased by 8 lbs.

Case 2. R.S.T. 23 years. Marked flatulence with discomfort in abdomen and occasional loose stools for 2½ years after an attack of dysentery. Frequent use of Mag. Sulph. only aggravated the condition. Some loss of weight. Stools show pus cells. Descending colon palpable and tender. Routine treatment carried on for 3 months with complete relief. No recurrence for over 9 months. Regained the lost weight.

Case 3. Mrs. S.M.D. 34 years. Loose stools with visible mucus, slight feverishness, loss of weight and anæmia for 3 months following child-birth. Frequent use of purgatives. Diagnosed abdominal tuberculosis. Stools show pus cells. Vaginal examination negative. Tenderness all over the colon. A low roughage diet, iron and liver orally. Ispaghula husks 2 dr. B.D. In a month, the patient felt right and had regained lost weight.

Case 4. Mrs. N.K. 25 years. Pain in abdomen and low temperature for 1 year with loss of weight. Tenderness present in right iliac fossa and round the umbilicus. Diagnosed abdominal tuberculosis 8 months ago. Vaginal examination negative Stools showed cysts of Ent. histolytica. One course of Emetine Bismuth Iodide—gr. iii. every night for 10 days, along with low pressure enemata with Enterovioform 1½ grams in one pint for one month and a low roughage diet. Apparently cured. Advised to carry on with isotonic Saline enemata for 2 months more.

Case 5. Mrs. R.L. 30 years. Fever for 6 months, loss of weight, pain in abdomen and loss of appetite for 4 months. Diagnosed as abdominal tuberculosis by several physicians. Thin and anaemic. Vaginal examination negative. Abdomen shows tenderness all over, especially the caecum which is palpable. Barium meal shows hypermotility and barium enema visualised the appendix and (?) feeling defect in caecum. Agreed to an exploratory laparotomy which was kindly done by Mr. S. N. Mathur in my presence. Surgeon

Mathur's report—"Large and small intestines normal in appearance and texture; no glanduar enlargement anywhere. Great omentum normal."

Case 6. M.A.M. 32 years. Dyspepsia, anorexia, loss of weight and irregular bowels with troublesome mental and physical fatigue for one year. History of dysentery 2 years ago. Tenderness of abdomen and gurgling present. Stools showed pus cells. Fractional test meal showed hypochlorhydria. Felt completely relieved after one month of low pressure enemata and a low roughage diet. Normal weight regained.

Case 7. Mrs. R.P. 46 years. Recurrent attacks of loose stools with abdominal pain and distension, low fever and loss of weight for 15 years; much worse for 6 months. Diagnosed as abdominal tuberculosis 15 years ago and again 3 years ago. On examination, she was emaciated (weight 72 lbs.) severely anæmic, marked glossitis present. Skiagraphy of the lungs negative. Barium meal examination shows marked hypermotility. Stools showed large number of pus cells. Given 4 tablets sulphaguanidine every 3 hrs. for 5 days. Then isotonic low pressure enemata with Enterovioform (1 gram in a pint) were started; low roughage diet given and iron orally in very gradually increasing doses. Proteolysed liver extract and nicotinic acid 100 mgs. were given thrice a day. Within 2 weeks, the clinical picture altered for the better. This was continued for 6 months. Now the weight is 84 lbs. and the patient says that she has never felt so well for the last 15 years.

Case *8.* Dr. S.S.L.M. 36 years. Frequent foul-smelling loose stools with occasional vomiting, fever and loss of 40 lbs. in weight in 4 months. Stools showed pus cells only and considered to be a case of abdominal tuberculosis. No response to the usual line of treatment. Marked glossitis, perleche and cheilosis present. Put on sulphaguanidine, nicotinic acid. Riboflavine, thiamine, proteolysed liver extract and low roughage diet. The clinical picture changed miraculously within 48 hours and he made a complete recovery in one month. This was 6 months ago. He has remained perfectly well.

Case 9. A.H. 30 years. Pain and distension of abdomen present constantly with frequent exacerbations. Loss of weight and low fever. Trouble started in 1933 after taking Unani treatment in which the patient is given very powerful purges for days in succession to drive out "evil humours" from the intestines.

Was diagnosed as abdominal tuberculosis over 10 years ago. Has taken several courses of Emetine injections. Thin and anæmic. The cæcum was thickened and was palpable. Barium enema showed filling defect in the cæcum. Put on routine isotonic low pressure enemata for 4 weeks with only slight relief. Later, 4 ounces of curled milk with butter removed was added to 1½ pints of the istonic enema fluid. This was reported by the patient to be remarkably beneficial and his flatulence and abdominal pain subsided after 3 months of treatment and the cæcum was not palpable any longer.

Treatment Suggested

The various points have been described in my previous paper (1946) but subsequent experience has led to certain improvements in the technic.

Rest in bed is essential only in the severe cases; in others, it need not be insisted upon. A warm abdominal binder has been particularly appreciated by all patients. It gives valuable support to the flaccid abdominal wall.

If diarrhoea is troublesome and particularly when the stools are foul-smelling and show a rich bacterial flora, sulphaguanidine often acts as a charm. It is best given with vitamin B complex, because a prolonged use of the former is likely to produce a relative deficiency of the latter. Many cases show evidences of thiamine, nicotinic acid and riboflavin deficiency. These should be given freely. Proteolysed liver extract is often very helpful. Iron should be given in small doses to start with and later increased. For the constipated, few things are better than Ispaghula husks, two teaspoonfuls twice a day. Purgatives must never be given. Diluted acid is given after meals in suitable cases.

In cases of chronic amoebiasis, Emetine is no more exhibited and reliance is placed on E.B.I. orally and Iodochloroxyquinoline retention enemata. For giardiasis, mepacrine is helpful.

Particular stress is laid on suitable diet for these cases. It must be ample (they have all lost considerable weight) and properly balanced and with as low a roughage (cellulose) content as possible; wheat flour should be finely sieved and the skin of the various pulses carefully removed; green leafy vegetables must be tabood and the pips and skins of fruits must be rejected. Fresh cow's milk curd is valuable for the prevention of flatulence and is best taken in the morning in place of tea or coffee. All spices, pickles, highly-seasoned and greasy food and tough meat must be eschewed. Milk is usually not well toleraetd. In the beginning, thinly-made "khichri" is perhaps the best. Later, other things are added.

The daily use of low pressure (the height of the enema-can should never exceed 8 inches) isotonic saline enemata (one dram of pure sodium chloride and half-a-dram of Sod. Bicarb to a pint of *warm* water) usually taken after bowel evacuation remains the standby of this treatment. If the patient has no time for it in the morning, it can be taken in the afternoon or night and should be retained as long as possible. In the beginning, only a pint is taken and this is later increased to two pints.

Recently I have started adding to the enema fluid 2 or 4 ounces of fresh liquid curds from which the butter has been removed on the belief that its lactic acid content will help to modify the intestinal flora and the patients seem to find it particularly helpful (case No. 9). Finally, the psychological factor must be kept constantly in mind. Repeated reassurances that the patient is not suffering from abdominal tuberculosis is appreciated. The warning, however,

that the treatment will have to be prolonged and that relapses are possible in the beginning, must be given.

Discussion

It is not denied that primary abdominal tuberculosis is unknown or even that it is very rare. Clear-cut cases are at times observed, particularly the peritoneal variety and less frequently the glandular variety. But in these cases, as mentioned above, the various symptoms and signs are fairly well-defined, but to diagnose abdominal tuberculosis with the frequency with which it is done in this country and on such vague data seems unscientific and irrational in view of all available pathological and surgical experience. Case No. 1 in my previous paper (1946) and case No. 5 described above are particularly instructive. The ideal and conclusive evidence would be if all such cases could have an exploratory laparotomy but such an advise would be hardly feasible or practicable or even wise. Recently, on my suggestion, Prof. A. M. Khan and Dr. A. Wahid of the Department of Anatomy of my college have kindly agreed to carefully examine (after a lower abdominal incision) all the dead bodies coming to their department for dissection purposes, and I have to submit their report, which is bound to be interesting and, I hope, conclusive.

Summary

While not denying the possibility of the occurence of primary abdominal tuberculosis, it is urged that this diagnosis is being made far too frequently. It is suggested that the underlying pathological lesion of this symptom-complex is chronic colitis due to various causes, but not tuberculosis. A definite line of treatment has been evolved and it has been found to be of value.

Acknowledgments

My grateful thanks are due to Prof. Sahai, Prof. M. A. Hameed and his colleagues of the Department of Pathology, Drs. R. Lal and Chatterji of the Department of Radiology, Prof. A. M. Khan and Dr. A. Wahid of the Department of Anatomy, Surgeon Mathur for the laparotomy, my successive house-physicians, Drs. P. N. Mehrotra, K. K. Rohatgi and R. P. Singh, the nursing staff of the medical wards and to Messrs. Ciba Ltd. for the free supply of Enterovioform.

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SPECIAL ARTICLE

CONGENITAL VITAMIN DEFICIENCY

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During my stay in Bengal for the last five years a condition of deficiency disease in children has been observed in quite a large number of cases marked by chronic intestinal disorder, which have got signs and symptoms of both cœliac disease and rickets, but do not conform to the typical description of either of them, as we find in our text books of medicine which are predominantly by European or American authors. Neither it suits the suggestion that they are cases of cœliac disease with rickety changes in the bone formation nor they are essentially cases of rickets with gastro-intestinal disorder simulating cœliac disease.

A case of rickets has the following premonitory symptoms and signs: (*a*) Restlessness and irritability, (*b*) sweating about the head specially when asleep, (*c*) choosing cool places and kicking off bed clothes and pulling out vests, (d) child flabby and pale, (*e*) capricious and sometimes voracious appetite, (*f*) delayed dentition, (*g*) delayed locomotion and assumption of erect posture.

Then it starts (*i*) changes in the epiphysis of bones, (*ii*) delayed closure of the fontanelles, (*iii*) flabby limbs (acrobatic rickets), (*iv*) anæmia, (*v*) enlargement of the liver and the spleen, (*vi*) recurrent attacks of respiratory diseases and (*vii*) intestinal disorders. The intestinal disorder that comes in the train of symptoms are characterised by pale offensive stools with fermentation and distension of abdomen resulting into pot belly, occasionally dysentery but the reaction is always acid and the cellular exudate and macrophage of bacillary dysentery are absent.

Coeliac disease is shown by a child between the age of 6 months to a year by losing appetite, failing to thrive and having slight diarrhœa. Soon characteristic stools appear which are large bulky, pale, extremely offensive and frothy in character almost simulating that of sprue. The buttocks wither, abdomen becomes doughy and distended, mental changes happen as the child grows up. He becomes hysterical, irritable and difficult to manage, bites the mother and nurses but dentition is not delayed and though there is muscular weakness, the child can crawl and stand erect almost in normal period. Rickety changes in the bones happen after a period of 6 months or a year and it may also be delayed to some years. Involvement of the respiratory system and convulsions that often happen in rickets is less marked in this disease and they do not appear as complications but as fresh infections of other diseases to which the child becomes extremely liable.

The babies with deficiency disease mainly showing gastro-intestinal disorders that I have observed, have in a typical case symptoms and signs as follows:

Child has started with some amount of diarrhoea, the stool being large but frothy and changing to a

greenish hue after being left exposed for sometime. Child was having mother's milk all the time but on account of suggestions made by the physician or relatives that mother's milk is unsuitable, changes have been made in the diet which best suits the imagination of persons in charge of the case, beginning from admixture of barley water and cow's milk to arrowroot and Sati food and other articles of carbohydrate nature. If possible, proprietary foods have been tried one in succession to another beginning from Horlicks, Glaxo to other powdered milks with some improvement in the beginning but later failing as before. Child after about 3 to 6 months of this intestinal disorder, sometimes better sometimes worse, begins to lose flesh, does not sustain growth, buttocks begin to wither and the head becomes big and the belly prominent and full of wind but not doughy in character as in coeliac disease. The bones now begin to show changes in the epiphysis and rickety rosary begins to appear. The fontanalles remain open even after 18 months and the skull begins to be bossy at suture lines. The diarrhœa now turns into evacuations of different hues. Sometimes green flaky mucus also is found and the child gradually dwindles inspite of all gastro-intestinal antiseptics differently combined. The stools examined do not show any evidence of ova or amœba. It is generally slightly acid or neutral. There is evidence of undigested starch and fats with a few pus cells and conforming neither to the characteristics of amœbic, bacillary or giardiasis dysentery.

TABLE SHOWING THE DIFFERENTIATING POINTS IN THE THREE CLINICAL CONDITIONS DISCUSSED

Rickets	*Coeliac disease*	*Congenital vitamin deficiency*
1. Child had not usually mother's milk.	Mother's milk available.	Mother's milk available but not ample.
2. Want of sunlight and ultra violet rays.	Children of urban population with vitiated air.	No want of sunshine or village atmosphere.
3. Stools pale and offensive with gas.	Large, bulky, very offensive with plenty of undigested fat, frothy in character.	Large, frothy, changing to a greenish hue after exposure and sometimes with flakes of green and white mucus.
4. Examination of stools; reaction—neutral; pus cells—a few.	Plenty of undigested fat, reaction—acid; no pus cells usually.	Plenty of undigested starch; reaction—faintly acid; pus cells—numerous.
5. Abdomen—pot bellied with bulging below as if with fluid.	Large, doughy feeling and full of gas.	Large with distended intestines and veins full at sides.
6. Softening of the bones with enlargement of epiphysis appears early and the bones are distinctly tender.	Enlargement of epiphysis appears later, but the sites are not tender (so late as the age of 7 years) Genu valgum is more prominent than other deformities.	Enlargement of epiphyses appear about the age of 1 year and dentition is also delayed but no tender spot in the fontanelles.
7. Laxity of ligaments.	No flail limbs.	Laxity of ligaments occur in moderate degree.
8. Respiratory complications frequent.	Respiratory complications not found.	Respiratory complications less frequent than rickets but they are liable to catch cold often.
9. Nervous symptoms like irritation, restlessness and convulsions are common.	Child is precocious and irritable and difficult but convulsions and fits are not in evidence.	Child also becomes irritable and difficult but it is more often its unsatisfied hunger that produces it.
10. Diet that is mainly wanting is easily assimilable fat-containing food rich in vit. A & D. Codliver oil is the sheetanchor, or any of its derivatives like ostein or adexolin.	A diet high in protein, low in fat and practically no carbohydrate is needed. Vit. B (complex) and liver extract injections.	A high protein and low carbohydrate diet together with a generous use of colloid calcium with vit. D by injection.
11. Rickets can be cured and once cured except for the bony changes with their disfigurement the child grows normally afterwards.	Unless properly tackled changes into a condition like tropical sprue and intercurrent disease generally carries it off.	Is curable. Though if left long, results into a child stunted in intellect. Grows into a nervous child and becomes ill-fitted for the arduous life of the present day world.

There are several points that have occurred to me in investigating these cases:

(1) This condition is often found in children when the mother has too frequent pregnancies though she looks apparently healthy.

(2) That for some reason or other mother's milk though fairly ample, has been stopped and many changes have been made in prescribing diet for these babies.

(3) The child has been again put on the mother's breast when it is a year old and the child, as usual in our country is allowed to suck even when the milk from the breast has lost all its nourishing qualities.

(4) That the baby is not the first one of the mother. The usual history is that the first child developed into a healthy one but the subsequent ones dwindled and unless properly treated, died in infancy.

(5) Wassermann reaction of the parents examined in some of my cases was completely negative and the child did not show the slightest signs of congenital syphilis.

So far as I can judge, the condition seems to be one in which the mother on account of frequent pregnancies has herself suffered from minor vitamin deficiencies specially of the A and D group and the offspring has shared in this in its fœtal life. It thrives fairly well in the first three months, though on the devitalised milk of the mother, but very soon she is exhausted and the child begins to show want of these vitamins, and the various patent foods given one after another produce a vicious circle and this condition of malnutrition results I think that my surmise is correct as with treatment to supplement these

vitamins to the baby and also to the mother and by encouraging breast feeding up to the 9th month the child recovers and begins to put on flesh again.

The replacement of vitamin D and calcium is quickly achieved by subcutaneous injections of colloidal calcium with Vit. D given daily and the feed changed into a high protein and low carbohydrate one as we usually do in the treatment of coeliac disease. The mother's food is also changed in the same manner and she is given milk liberally and calcium gluconate by mouth as also cod-liver oil if she can tolerate it.

What I am more concerned with is the possibility of preventing this condition growing in the children of our generation, specially at the present epoch, when economic condition, stress of existence and the non-availability of wholesome food even at a very high price compared with prices before this devastating war, have all created a condition which are baffling to us physicians. Added to that is the social custom where prevention of frequent childbirth to a devitalised mother is either unknown or even if known as in families where members are doctors are never practised or countenanced. The so-called educated people neither practise abstention nor scientific prevention and leave everything to fate. Unless this curse of too frequent pregnancies and getting successive babies out of devitalised mothers is removed and the public impressed about its banefulness, this disease will be on the increase and will produce a future generation of tiny individuals with brains perhaps but no brawns to survive. This huge waste with starvation of children with barley water for want of milk and patent foods for want of other sustenance, hunting for them in every corner of the black market must stop. Physicians should take it up as a moral duty to inform the public about this cursed condition where a mother is required to produce dozens of children in the smallest possible time.

CASE NOTES

HYDATID CYST OF THE KIDNEY

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Hydatid cyst of the kidney occurs in about five per cent of all cases of ecchinococcus disease in man. Begg (1936) collected informations of 287 cases of hydatid cysts of the kidney, including pararenal cysts, from almost all over the world which occurred between 1925 and 1935; but that list did not show any case from India. As far as my information goes, two cases were reported in India—one from Bengal in 1934 and the other from South India in 1933. Hence a new case of this rare disease merits publication.

CASE RECORD

A patient, aged 26, complained of occasional dull pain in the right loin and right side of the abdomen during the previous five years. He also suffered from three attacks of acute colicky pain in the abdomen during the five months previous to admission. The attacks were associated with dysuria, vomiting and fever. He said that he passed a few small (?) stones in his urine during those colicky attacks.

On admission—Temperature, 100° F., Pulse—82 p.m.; Resp.—18 p.m. On abdominal examination—a cystic mass was felt in the right hypochondrium, extending into the right loin. Clinically it was a case of renal swelling. Urine examination—alkaline, sp. gr.—1018; a few pus cells and R.B.Cs.; culture—sterile. Blood count—Total W.B.C. 10,000 per c.mm.; differential count—poly. 80 per cent, lympho. 13 per cent, eosino. 7 per cent. Plain x-ray showed a small radio-opaque shadow in the region of the right kidney. Right kidney was enlarged in size. Excretion pyelography showed no excretion of dye from right side. In the upper part of the dense renal opacity (R) there was a rarefied area (S) inside which again there was a smaller dense shadow (see bottom left of plate facing page 338). Blood urea—30 mgm. per cent. Retrograde pyelography was not done. Provisional diagnosis of infected hydronephrosis was arrived at.

Under spinal anaesthesia kidney was exposed (Morris's approach). It was found much enlarged, cystic and adherent to its surroundings. While freeing the adhesions, a part of the cyst wall gave away and through this, multiple small cysts were discharged. Nephrectomy was done. The area was swabbed with one per cent formalin and the wound was closed in layers, leaving a drain.

The kidney was of the size of a small cocoanut The surface showed cystic bullæ. Section revealed a small area of kidney tissue at the upper pole; the body and lower pole were distended and stretched out by the cyst. The pelvis was markedly dilated and the ureteric orifice was blocked by a daughter cyst. The ectocyst (both the laminated membrane and the germinal layer) was easily separated from the pericyst (false capsule of the host) (see bottom right of plate faeing page 338). Histological examination showed the simple cyst wall and a marked eosinophilic infiltration of the kidney tissue around the cyst. Microscopic examination of the scrapings of the ectocyst showed the scolices with hooklets.

The patient made an uneventful recovery.

DISCUSSION

Hydatid disease itself is not so uncommon in India as is generally supposed. Mahadevan and Menon in 1933 reported that eight cases of hydatid disease had been recorded in the Pathology Department, Medical College, Madras. Maplestone in 1933 reported that four cases had been seen in the Medical College, Calcutta, between 1928 and 1933. In a Military Hospital, Dacca, I have seen a case of hydatid cyst of neck in a Gurkha patient. This disease in often found amongst N.W. Frontier people who lead a nomadic life and have close association with dogs. This patient was a Pathan from N.W.F. India. Sixty per cent of the cysts occur in the liver, twelve per cent in the lungs and the remaining twenty-eight per cent may occur in any organ or tissue. As a rule only one organ is affected.

Infection of the kidney may be primary (Hexacanth embryo), secondary (from some other part of

the host) or an invasion from an adjacent organ. The disease very rarely involves both the kidneys at the same time. As a rule there is a single cyst containing a number of daughter cysts formed in the kidney substance. Spontaneous perforation is not uncommon. The contents of the cyst may be extruded in the renal pelvis and then carried downwards by the urine. In these cases, characteristic hooklets may be found in the urine. Calcification may take place in the cyst wall. Infection may occur and pus or blood may be found in the urine, suggesting a diagnosis of infected hydronephrosis, as in the case under review.

Begg (1936) classified hydatid cyst of the kidney into three groups: (*a*) open type—where the cyst communicates with the pelvis, (*b*) closed type—with no communication with the pelvis, (*c*) pseudo-closed type—where the pericyst communicates with the pelvis. Pain of a dull aching character is perhaps the most constant symptom. During extrusion of its contents, severe colicky pain may simulate that of renal colic. Probably it is the salient feature of the open type. The presence of a mass in the kidney region, with a firm smooth surface and accompanied by frequency of micturition is present in so many renal conditions as to afford little aid in the diagnosis of echinococcus infection. Similarly, deformity in the pyelogram may be due to many other pathological conditions of the kidney. The finding of hooklets or daughter cyst or portion of the cyst wall in the urine is pathognomonic. Of the seventeen cases collected by Kretschmer, preoperative diagnosis was made in four only and in all those cases patients gave a history of voiding cysts.

After operation when the patient was shown the specimen, he identified the daughter cysts as the "stones" passed by him during the attacks of colic. Complement fixation test, Casoni's intradermal reaction and eosonophilia are positive in the majority of cases. This patient, as already mentioned, had 7 per cent eosinophilia.

It needs emphasis that one should bear in mind the possibility of echinococcus while investigating a case of renal tumour.

Treatment of hydatid disease of kidney is either nephrectomy or marsupialisation and drainage, depending upon the amount of functioning kidney substance left. In the majority of cases, nephrectomy would be necessary, owing to the late diagnosis and likelihood of infection. The lumbar route of approach is preferable to transperitoneal method as the latter has the risk of peritoneal implantation and anaphylactic shock.

Acknowledgment—This case was operated by me while I was a Surgical Specialist in the Indian Army. I am grateful to Lt.-Col. Sanghamlal, I.M.S., the Officer-in-charge of the Surgical Div. of 77, I.G.H. for his useful guidance and kind assistance during the operation. Thanks are also due to Col. P. H. Cummins, I.M.S. Officer Commanding of the Hospital, for his valuable suggestions.

The specimen was demonstrated by me at a clinical meeting of the 17th British General Hospital, Dacca, in 1944.

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A CASE OF MULTIPLE CYSTS—LUNG

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The following case is reported on account of its comparative rarity.

M.G., a muslim boy, aged 8 years, was admitted on 14-12-46 for the treatment of hæmoptysis of 3 months' duration with no fever and no cough.

Previous history—Healthy.

Family history—This boy is the third child in the family. The first one died of small-pox in early childhood. The second, fourth and fifth children are well. No pets in the house like dogs etc.

On Examination the boy looks quite healthy and active with no temperature or cough. Examination of the chest revealed that xiphisternal pulsation is more prominent. Otherwise the lungs and heart were clinically normal. The boy used to expectorate pure red blood in his sputum once in two or three days. Then skiagram of the chest was taken (see plate facing page 339). It showed one rounded opacity in lower left lung field and two opacities, one well marked in the upper right lung and one faintly marked in lower right lung. The heart is pushed towards the right by the opacity in the left lung. Electrocardiogram shows that there is no dextrocardia.

The following further investigations were done:
Blood picture—Hb. 95 per cent, R.B.C.—5·1 mill/c.mm., W.B.C.—14,000 per c.mm.; Differential count: poly—68 per cent, lympho—28 per cent, eosino—4 per cent.

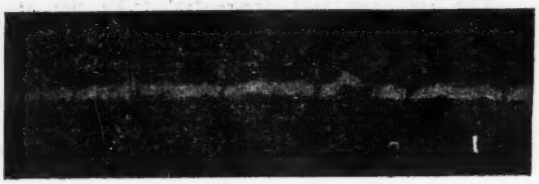
Blood Wassermann—weakly positive.

Sputum—Culture—negative. Acid-fast organisms not isolated on five occasions by microscopic examination.

Stools—No ova or cysts detected by repeated examinations.

Casoni Reaction: By kind courtesy of Dr. Gajjor, Bombay, Casoni reaction was done and it was positive.

Paracentesis—On 29-1-47, it was decided to put in a needle into the cyst in the upper right lung as



LEAD 1

LEAD 2

LEAD 3

LEAD 4

E.C.G. OF THE REPORTED CASE SHOWING THAT THERE IS NO DEXTROCARDIA

the margin of this cyst was close to the pleura and the approach could be made through the fourth interspace in the right mid-axillary line. 10 c.c. of clear fluid was withdrawn and on microscopic examination after centrifugalisation no hooklets were found. As this procedure did not upset the patient in any way 50 c.c. of fluid was withdrawn from the same cyst on 7-2-47 and again on examination hooklets were not found. Another skiagram (see plate facing page 339) taken 2 months later after the withdrawal of the fluid shows air also in the cyst.

Diagnosis—These rounded shadows are cysts containing watery fluid; of this there is no doubt as watery fluid is actually withdrawn from the cyst. Hooklets are not found in the fluid. This, in my opinion, makes the diagnosis fairly clear that the cysts are not hydatid cysts. The positive Casoni reaction obtained above is a false one.

In congenital cystic disease of the lung the following varieties are described:

(1) The large balloon cyst. (2) The solitary cyst. This may occupy half the lung field. (3) Multiple medium-sized cysts, often situated near the root of the lung. (4) Multiple small cysts. These cause a honeycomb appearance of the lung resembling bronchiectasis. The cysts may contain air only, or the contents may be watery, mucoid, or purulent, if they became infected. It is probable that in all cases, the cysts are of bronchial origin.

Taking all facts into consideration the *diagnosis* of multiple cysts of the lung of congenital origin (or one variety of congenital cystic disease of the lung) was made.

As the cysts were formed bilaterally, surgical intervention was one of the questions. As the child was active and did not suffer from anything except a little hæmoptysis, now and then, the parents were advised to keep the child in the school, but to bring the child for observation once in two or three months' time.

Acknowledgments—My thanks are due to Dr. Joshi, L.M.S., M.O. I/C of the hospital for permission to publish this case and Dr. Nasiruddin, Radiologist, Osmania Hospital for E.C.G. and skiagrams.

JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, JULY, 1947

A. M. A. CENTENARY

Last month the American Medical Association celebrated its centenary at Atlantic City, New Jersy. This celebration heralded the fulfilment of a century of progress from May 5, 1847, when it met for the first time in Philadelphia. The United States of America is a vast country with different climates and is inhabited by descendents of people from a number of countries. But it is, as the name suggests, united by a common language and common ideal.

Perhaps it is not known that the A.M.A. made a humble beginning in 1847, with the primary purpose of advancement of medical education. The few schools, scattered over the continent, were mostly owned by a group of physicians to enhance their individual income and prestige. The medical organisation was poor. Suggestions for improvement were made from time to time but nothing happened till 1901, when a democratic organisation was established. The organisation of the A.M.A. may be briefly outlined here.

The Board of Trustees consists of nine members. Each member serves a term of 5 years, when he can offer himself for re-election for another term. But no one can be selected after he has served for ten years. The Board meets four times a year and its Executive Committee meets every month. The House of Delegates consists of a maximum membership of 175. This is the policy-making body and at its annual meeting, the Board of Trustees gives an account of its activities during the year. The members to the Board of Trustees are elected from the House of Delegates. Representatives of the House of Delegates are elected from the State Societies which consist of County Medical Societies. The County Medical Society is the unit of the A.M.A. and there are more than 2000 such societies. The House of Delegates appoints the Standing Councils and *ad hoc* reference committees to carry on the work of the A.M.A. There are many councils *e.g.*, on medical services, medical education and hospitals, on industrial health, etc. The Council of Pharmacy and Chemistry, the Therapeutic Trials Committee, the Council of Food and Nutrition are well-known in this country for their notable contributions in the cause of medicine and public health. The principal permanent officers are the Editor of the J.A.M.A. and the Secretary and General Manager. The J.A.M.A. was born in 1863. The name of George H. Simmons, an Englishman by birth, is written in letters of gold in the history of the A.M.A. and its Journal. In 1889, he became the Editor of the Journal and was the moving spirit of the Association during this time. He reorganised the whole Association and was responsible for its growth since 1900. He was also the secretary and general manager of the Association. The circulation of the Journal rose and it is now more than 133,000 copies weekly. It may be mentioned that the Journal is now printed at its own printing department employing more than 350 persons. It has many flat bed presses and four rotary presses. In 1908 special periodicals were initiated with *Archives of Internal Medicine* followed by *American Journal of Diseases of Children.*

Progress is the keynote of Americanism. Technology is the basis of progress. And in no other country technology advances with such rapid strides as in the U.S.A. American medicine is full of technological devices and it has built up its tradition on quality, detail, speed and application of the latest technological devices in the relief of human ailments.

It is not perhaps known in our country that the largest number of medical journals is published in the U.S.A. The medical men are prolific writers and some of the best specialised journals in medical science come out of the New World.

"It is perhaps not fanciful to see in the bustling progress of American Medicine the spirit of Frontier, eager to deal quickly with the enemy and impatient of obstacles, a spirit that is aggressive, invigorating and productive of results."[1]

[1] *Brit. M. J.*, 1:931, 1947.

CURRENT TOPICS

NEED OF PRODUCTION OF AND RESEARCHES ON ANTIMALARIALS IN INDIA

Dr. U. P. Basu, D.SC., P.R.S., F.N.I. and Mr. S. Mukherjee M.SC. from the Bengal Immunity Research Laboratory, Calcutta, write:

Malaria is by far the most important disease in India and it is difficult to make an accurate evaluation of the loss to the country for which malaria is responsible. If the latter be calculated in terms of money, then according to the Report of the Bhore Committee the loss may be anywhere between 300-500 crores of rupees per year. It is surprising that we should suffer such a loss for a disease which is considered to be that of mosquitoes, we ourselves being the hosts only. This is more so, since effective preventive measures against malaria have become available including potent chemicals for the destruction of the mosquito, and drugs for protecting man against infection. As a matter of fact the results of the antimalarial measures adopted by the Army during the last war in the malaria infested areas near the Eastern Frontier clearly demonstrate that it is quite possible to effectively control this idsease. An essential preliminary to the successful control of malaria would, therefore, necessitate the formation of an adequately staffed malaria organisation, working throughout the country under the auspices of the Government of India.

Present Activity

The Malaria Institute of India is the central organisation for advising the Government of India on all matters relating to malaria. It has many other functions and these have been clearly indicated by Major-General Sir G. Covell in the Delhi Souvenir Publication of the Indian Science Congress, 1947. On going through the publication one would wonder to find that there is no provision for researches that may lead to the isolation of a potent and effective insecticide or antimalarial. It may be pertinent to mention here the achievements of a body, the Office of Scientific Research and Development, which was set up in U.S.A. during the last great war for the development and survey of antimalarial drugs. Within the short span of 4 or 5 years, this body recorded the screening of as many as 15,000 antimalarial drugs. Of these again, approximately one-third were new compounds synthesised under its own auspices. This feat was achieved by the co-operative efforts of chemists, pharmacologists and clinicians in the laboratories of several universities, technological institutions and pharmaceutical industries. The scope of the activities of the Malaria Institute of India, as set out in the publication referred to above, conveys the impression that this would be content to carry on trials of various antimalarial measures and medicaments in this country which would presumably ever remain an enedemic area and a convenient field of trial. The drive of the Department of Industries and Supplies of the Government of India is, however, commendable as machinery has already been set in motion for the annual production of 1,500 tons of D.D.T. in India. It is high time that we should immediately consider the manuacture of one or other drug that has conclusively been found to be effective as a suppressive antimalarial whether that be quinine, mepacrine or chloroquin, and organise ourselves fully for researches that may lead to the synthesis of a product which might act as a true prophylactic.

Quinine Production

Quinine has for long been the drug of choice in the treatment of malaria. The average annual consumption of quinine in India immediately before the last war was about 210,000 lbs., but only 70,000 lbs. were produced in India. Recently production has increased to nearly 100,000 lbs. According to the Bhore Committee Report the amount of quinine required will be in the neighbourhood of 1,300,000 to 1,600,000 pounds per year considering that 120 to 150 million cases are to be treated annually and each case would require at least 75 grains of quinine. As it takes a considerable period for the cinchona plant to mature and yield its harvest, it would take some years for reaching such a target even by adopting large scale planting schemes. Moreover researches in other directions may evolve a better antimalarial by synthesis. This is a problem of considerable significance which should be critically examined before embarking on any ambitious programme of cinchona cultivation. It may, however, be mentioned that India is also handicapped for various reasons in any large scale production of synthetic medicaments. As such the acreage of cinchona cultivation can at least be increased to a considerable extent particularly when suitable lands as well as the materials required for the extraction of the alkaloids are available within the country. What is wanted mainly is the cheapness of drugs so that even people of the lowest rank may purchase them in adequate amounts for the effective treatment of the disease. It is for this that a central organisation, as also envisaged by Sir Frederick James in his remarks on the Bhore Committee Report, would be necessary for directing researches on an intensive as well as on extensive scale. Some of the lines in which investigations are badly needed are:

(1) *Studies of soils and pedological factors*—this would provide criteria by which the suitability of a land for cinchona can be ascertained with precision.

(2) *Cytological and genetical studies*—this would result in the evolution of more desirable strains. The high quinine bearing varieties are usually the more delicate ones, and the object of such investigations would be to combine hardiness and large bark yields with a high percentage of alkaloids, particularly quinine, and the richer the bark the less would be the cost of production in terms of quinine. It may be interesting to note here that the average quinine sulphate content of Indian bark is now between 4 and 5 per cent compared to about 8 per cent for Java bark in the years preceding the last war.

(3) *Studies on the improvements of cultivation methods*—this would involve experiments in manuring, in planting with different spacings, in different harvesting schemes, in anti-erosion measures and in various other plantation practices. During the last war, experimental plantings with close spacings were adopted by the Cinchona Departments as an emergency measure for the quick production of bark and these were then much advertised in the press (though wrongly) as being the Russian method. The results of this experiment are yet to be seen.

(4) *Chemical research*—for developing cheaper, simpler and more efficient methods of extraction of alkaloids from bark. The solvent extraction process is now of common application but this becomes too costly when bark of low alkaloid contents is treated. While the constant objective of the planter is the production of richer and still richer bark, the search for a cheap method of extraction of poor bark would still be useful. It is now believed that close planting of cinchona followed by uprootal of some of the plants before maturity, say after two or three years, would materially increase the bark output per acre. But these young plants would yield only a low alkaloid material. Another direction in which more attention is needed is the recovery of the alkaloids from the waste fractions of the cinchona tree, *i.e.*, all other parts excepting the bark. The available data show that the amounts of alkaloids thrown away with the wood, twigs and leaves would amount to not less than 50 per cent. of the total alkaloids obtained from the bark which alone are extracted. The percentage of alkaloids in this waste material however does not exceed 0·5 per cent. It would go a great deal in alleviating the scarcity of cinchona alkaloids if an economical method of extracting these materials could be devised. The application of ion-exchange principles to the continuous acid extraction process, recently being developed in the U.S.A., is worth consideration in this respect.

Further, it is essential that the authorities responsible for the development of cinchona and quinine production in this country should regard this as a national problem. At present cinchona is a provincial subject although the Central Government acts as a co-ordinating authority and determines the policy of distribution. But with increasing autonomy in the provinces as envisaged by the framework of the constitution now in the making , less reliance can be placed on individual provinces to act according to a co-ordinated plan. Cinchona should form a part of our National Planning, and, as was rightly pointed out by the Royal Commission on Agriculture, should be a reserved subject for the Central Administration.

Synthetic Antimalarials

As has been mentioned above it is imperative that we shall have to supplement our quinine production by some suitable medicament. Mepacrine, or the more recently developed drug, chloroquin, is known to be a good suppressive antimalarial. The latter is being found by Loeb *et al* (*J.A.M.A.*, **130**:1069, 1946) to be approximately three times more active than quinacrin (atebrin) against well standardised strains of *P. vivax* and *P. falciparum*, the two malarial parasites that are more responsible for the disease in man. Amongst these two, the latter, sometimes known as malignant tertian malaria, frequently results in fatalities unless a suitable drug is administered immediately after the manifestations of the disease. Fortunately however it is susceptible to known drugs and seldom gives rises to a recurrence of the disease if the patient be properly treated. The other one *P. vivax* is prone to recur periodically. The known drugs may only suppress it but cannot protect the patient from any future clinical attack. What we want is, therefore, an antimalarial which by its administration would prevent infection by any of the recognized human malarias. But no such drug is yet available that may be sufficiently effective in all the malarias and sufficiently non-toxic to warrant general usage. Search for such compounds is necessary for the cause of humanity. Under such circumstances attention is naturally directed towards the antimalarial drugs that are capable of suppressing the symptoms of malaria to a sub-clinical level and will terminate a clinical attack. Quinine, atebrin, paludrine and chloroquin all may be considered as suppressive drugs. The chemistry of the former two are all known and the methods of preparation of the latter two have recently been indicated (*cf.*, Das Gupta, Gupta and Basu, *Science & Culture*, **11**:704, 1945; Basu, and Das Gupta, *ibid.*, **12**:108, 1946) 'Paludrine ' is being developed by British workers and 'Chloroquin', which first emerged from a German laboratory, is being thoroughly studied by American workers (*cf.*, Survey and Hammer, *Jour. Amer. Chem. Soc.*, **68**:113, 1946. The problem is how to obtain this type of antimalarials in quantity to meet India's requirements. As 1·5 gm. of the drug is required for one course of treatment, even a production of 0·1 million lbs. of the antimalarial would only suffice for 30 million patients. From the administration point of view it may be mentioned that chloroquin does not cause pigmentation of the skin and is being found to act as an effective suppressive with a dose of one tablet of 0·1 gm. each per week. But even for the manufacture of the above quantity we have to produce many intermediate products like benzene, chlorine ethyl acetate (or chloracetic acid), metallic sodium, phosphorous oxychloride, thionyl chloride and diethylaminoethyl alcohol. The latter four compounds are not available in India at present, and have to be imported from abroad. There is nothing unusual in it as even the U.S.A., which is now produucing more than 0·8 million pounds of quinacrine per year, had to begin her fine chemical industries by importing intermediates from Germany before and even it may be added that quinacrine is also a suppressive antimalarial, and for its large scale production too we are handicapped to an extent for the non-availability of certain materials like sodium, phosphorous oxychloride, thionylchloride and diethylamine (*cf.*, Basu, *Current Science*, **13**:119, 1944). The requirement of this antimalarial would also be of the same amount but this is not so highly effective as a suppressive agent. Advantage may, however, be taken of the lower effective dose of its homologue, the butyl derivative (*cf.*, Siddons and Bose, *Indian M. Gaz.*, **79**:101, 1944), which exerts its schizonticidal activity in a dose of 0·5 gm. only, if it is found to be of real importance on extensive clinical trial.

Prophylactic Antimalarial

In discussing the production of synthetic antimalarial drugs it may be now mentioned that the major problem in the therapy of malaria now is the prevention of relapses in *P. vivax* infections. The relapses are believed to be due to the parasite which are not affected by the conventional antimalarial drugs. As such various methods of synergy treatment are followed. But as compounds of various types, such as 8-amino quinolines, 4-hydroxy, or, 4-methanol quinoline derivatives, sulphonamides, and amidines like paludrine are being noticed more or less to exert some action upon the exo-erythrocytic forms of one or other malarial parasite, it may be expected that a product may be isolated that would act as a true prophylactic drug in human malaria. For this investigation more interest on the part of synthetic chemists, pharmacologists, biologists and clinicians should therefore be drawn and grants from private, industrial and State resources should be further made available for the promotion of research

in this field. A co-ordinated work would, however, be necessary amongst the various groups of scientists working in different laboratories in order to develop the production of adequate and/or an effective anti-malarial. But the progress of the work whether from chemical, biochemical, pharmacological or clinical point of view will have to be controlled by a Central Authority.

Anti-Mosquito Measures

As mosquito is the transmitter of malarial infection, in any step for the eradication of malaria measures are to be taken against the breeding of mosquitoes as well as for the killing of the adults. It is known how pyrethrin the active principle extracted from the flower of the pyrethrum plant and the synthetic product D.D.T. are effective in their insecticidal property. A combination of the two products is being found to give satisfactory results. The development of insecticides and larvicides, and their subsequent application in fieldwork are also subjects of considerable importance. It is understood that the Malaria Institute of India devoted considerable time and energy in the above directions during the war period. For fieldworkers some mosquito repellants are also necessary and for all these extensive investigations may yet lead to an ideal insecticide, a better mosquito repelling cream, or, an effective sprayer. All these must be produced from indigenous sources and materials and for this all our own resuorces are to be pooled.

Conclusion

It may be said that while concentrating our immediate attention on the production of known and established anti-malarials, synthetic as well as natural, on large scale, an all-out drive would be necessary for undertaking other suitable measures as there is no certainty in which way solution may be achieved in stamping out malaria not only from this country but from the whole world. This demands a production of potent insecticides for taking the necessary anti-mosquito measures as already referred to. We understand that the manufacture of D.D.T. is already under contemplation under the drive of the Industries Department of the Government of India. There is no reason why we should lag behind in the manufacture and production of the standard and established antimalarial drugs too, whether by cultivation or by synthesis. Any synthetic drug can be considered to be effective only after a large field trial on human beings. As such it has been rightly remarked in the Bhore Committee Report that "There is a need for the active promotion of combined biochemical and clinical research aiming at the evolution of a suitable drug which will help not only to cure the patient for the time being, but also to destroy the parasite in him completely." Such a resarch may lead to the synthesis of a true prophylactic drug and it is for this that a co-ordinated work among chemists, entomologists, pharmacologists and clinicians would be absolutely necessary. This naturally demands the formation of a joint board for the co-ordination of malarial studies and this board may easily be constituted by members representing the Health Department, Council of Scientific and Industrial Research, and the Medical, Chemical, Pharmaceutical and Trades' Associations. It may be easily said that if all the resources that are at our disposal, be properly controlled and judiciously utilised, India will have been rid of the scourge of malaria in very near future.—*Indian J. Pharmacy*, **9**:20, 1947.

CURRENT MEDICAL LITERATURE

Addison's Disease, a Diagnostic Problem

Siglin (*Proc. Staff Meet. Mayo Clin.*, **22**:17, 1947) writes that important procedures, one or more of which may be used in diagnosis of atypical chronic Addison's disease are the following: (1) The intake of sodium chloride is restricted, with intentional precipitation of acute adrenal insufficiency. (2) Determination is made of the effect of administration of cortical hormone on renal excretion of electrolytes. (3) Sodium chloride is reduced in the diet and potassium is added. Thereafter, determination is made of the chloride content of urine excreted from the forty-eight to the fifty-second hour. (4) The so-called water test is performed. The first part of this test consists of comparison of the volume of urine passed during the night, with the volume of the largest hourly specimen passed in the course of the next morning, after administration of a measured amount of water. The second part of the test consists in solving of the following equation:

$$A = \frac{\text{Urea in urine (mg. per cent)}}{\text{Urea in plasma (mg. per cent)}} \times \frac{\text{Cl in plasma (mg. per cent)}}{\text{Cl in urine (mg. per cent)}} \times \frac{\text{volume of day urine (c.c.)}}{\text{volume of night urine (c.c.)}}$$

(5) Determination is made of the milligrams of 17-ketosteroids in the twenty-four hour urine specimen.

The first of the foregoing procedures is potentially dangerous; the second, requires carefully conducted balance studies; the third gives the most dependable, practicable, diagnostic procedure now known; in the fourth, a positive result is suggestive of the presence of Addison's disease whereas a negative result fairly conclusively excludes its presence; in the fifth, values of 17-ketosteroids that are suggestive of Addison's disease are less than 1 mg. for females and less than 4 mg. for males.

The author reports a case which illustrates the value of some of the foregoing diagnostic procedures in the absence of characteristic clinical phenomena.

Blood-Pressure and Age

A year or two ago we suggested that "few would now rely on the old dictum that the normal systolic blood-pressure, expressed in mm. Hg equals 100 plus the patient's age expressed in years." *Lancet*, **2**:549, 1943) Now we have American workers expressing the opinion that "the old maxim '100 plus the age' may actually be a fair index of normal systolic blood-pressure." (*Am. Heart J.*, **32**:468, 1946). This conclusion is based on a series of 5331 white men between the age of 40 and 95, some of whom have previously been reported on. (*Ibid.*, **26**:11, 1943 and *Lancet*, **2**:549, 1945)

Analysis of the average systolic and diastolic pressures showed that though both rise with increasing age, the rise in the former is much greater. Thus the average systolic pressure increased from 133·3 mm. Hg in the 40-44 age-group to 164 in the 85-95 group, while the corresponding figures for the diastolic pressure were 84·8 and 90. This change with age is shown even more clearly by a comparison of the proportion in each age-group with "normal" blood-pressure (145/95 or less), systolic hypertension (150 or more/95 or less), and diastolic hypertension (diastolic pressure of 66 or more). The percentage with "normal" blood-pressure fell progressively with age from 87·2 at 40-44 to 27·8 at 85-95, while there

was an equally striking increase in the incidence of systolic hypertension—from 4·2% to 45·2%. The rise in incidence of diastolic hypertension was less marked from 8·5% at 40-45 to 27% at 85-95. The trends of "normal" systolic and diastolic pressure showed a progressive rise: the systolic rose from 129·6 at 40-49 to 134·1 at 80-95, the corresponding diastolic figures being 80·9 and 74·5. With advancing years there was no significant change in the incidence of pressures of 120/80 or less, but there was biggish rise in the frequency of systolic pressures between 140 and 149 (from 18·6% at 40-49 to 40·9% at 80-95). Diastolic pressures below 70 rose from 3·6% at 40-49 to 21·20% at 80-95. The fact that diastolic pressure tended to fall rather than rise as age increased is adduced in answer to any suggestion that the series is vitiated by the inclusion of people with latent or potential hypertension.

If, as these observations indicate, the systolic pressure rises with age, what is the mechanism? Two factors are probably involved—a neurogenic and a vascular. Russek and his associates (*Am. Heart J.*, **26**:398, 1943 and *Ibid.*, **19**:113, 1945) have already shown that the reactibility of the blood-pressure, as judged by the cold pressor test, increases with age; and Dock (*New York State J. Med.*, **45**:983, 1945) believes that this increase is related to trophic loss of neurones with ageing. The vascular factor, however, is probably more important, consisting of a progressive diminution of elasticity of the aorta and its larger branches. This change results in a higher systolic and lower diastolic pressure, whereas the neurogenic factor raises both systolic and diastolic. In other words, the neurogenic and vascular factors have a summating effect on the systolic pressure, but opposing effects on the diastolic pressure.

Two practical implications emerge from this study: (1) the upper limit of normality for the systolic pressure in the elderly must be accepted as considerably above 140 mm. Hg; and (2) in identifying essential hypertension emphasis must be laid on the diastolic rather than the systolic pressure. This latter view has been gaining ground in recent years; Hines, (*J.A.M.A.*, **115**:271, 1940) for instance, suggested that only the diastolic pressure is of value in predicting the subsequent development of hypertension. It has also been generally accepted for many years that the prognosis in the elderly is much better with systolic hypertension than with diastolic hypertension. What is only now being elucidated is the "normal" blood-pressure for that increasingly large section of the community over the age of 50 years.—*Lancet*, **1**:565, 1947.

Erogothioneine and Thyrotoxicosis

Ergothioneine has long been familiar to students of biochemistry because its presence in the red blood-cells interferes with the accuracy of many methods of determining blood-sugar and blood uric acid. Its function, if any, in the red cells has been wholly obscure, and it has been regarded as pharmacologically inert. The work by Dr. Lawson and Professor Rimington (*Lancet*, **1**:586, 1947) entirely alters its status, and raises the question whether the traces of the ergothioneine found in normal blood may not have great importance in connexion with thyroid activity.

For the last four years thyrotoxicosis has been treated with a variety of sulphur-containing substances. Thiourea was the first, to be rapidly succeeded by thiouracil and other compounds. The action of these substances is dramatic, and much clinical improvement is produced in most cases of primary Graves's disease; but it is not yet clear how far the chemotherapeutic attack is really an adequate alternative to surgery and certainly it is not entirely free from risk. The effect of treatment with all these drugs is to cause the iodine content of the thyroid to fall, while the gland itself may enlarge. All the most active compounds so far tried contain the grouping >N—CS—N<, and it occurred to Lawson and Rimington to try the effect of ergothioneine, which also contains this grouping, on the thyroid glands of normal rats. The hoped-for result was realised: when given in similar dosage by injection, ergothioneine, like thiouracil, reduced the iodine content and raised the weights of the rats' thyroids. The quantitative result of its administration, though resembling closely that of thiouracil in the same dosage, was much more variable—perhaps because of differences in the initial level of ergothioneine in the individual animals. Hunter (*Biochem. J.*, **22**:4, 1928) and Eagles and Vars (*J. Biol. Chem.*, **80**:615, 1928) noted considerable variation in ergothioneine content not only between different species but also in the same species: thus Hunter recorded a range of 2·5 to 8·0 mg. per 100 ml. red cells in normal men, while pigs usually ranged from 20 to 50 mg. per 100 ml. and cats and oxen all had less than 2 mg. We have as yet no data for ergothioneine levels in thyroid or other disease, but Lawson and Rimington now have this under investigation.

One may reasonable expect that administration of a normal blood constituent in amounts of the same order as those found in normal blood will carry no risk of toxic manifestations. If ergothioneine proves both effective and non-toxic, another great step will have been taken in the medical treatment of thyrotoxicosis. Publication of clinical observations based on Lawson and Rimington's work will be awaited with great interest.—*Lancet*, **1**:602, 1947.

Human Water Requirements

Mellanby (*Brit. M.J.*, **1**:774, 1947) in a paper entitled 'Human Water Requirements', read at a recent meeting of the Nutrition Panel of the Society of Chemical Industry, pointed out that the earliest forms of life existed in the sea, being bathed in a salt solution. There was some evidence that the composition of sea water was different than from what it was to-day, and salt concentration in protoplasm seemed to indicate this. Thus primitive organisms were able to get rid of their waste nitrogen in the form of ammonia, which rapidly diffused in the surrounding water. When organisms evolved to a terrestrial existence they were at once in a position in which desiccation took place, and they developed a more or less watertight covering and got rid of their waste nitrogen in a form less toxic than ammonia. The insect had its watertight cuticle and the bird its feathers, which cut down moisture loss from the skin surface, and both had a nitrogen end-product in the form of relatively insoluble purines which required little water. Man had not evolved a watertight body surface, and he excreted his nitrogen in the relatively non-toxic form of urea, which required a certain amount of water.

Water Content of Man.—Dr. Mellanby gave the following figures for the water content of an average (70-kg.) man:

	Percentage of body weight	*Litres*
Intracellular (actual protoplasm of cells) ..	40-50	35
Tssue fluid ..	12-15	11
Extracellular		
Plasma	4-5	3
		49

It was usually found that the production of 'metabolic' water and the loss of water by evoporation in the lungs ran parallel. The individual at rest lost little from the lungs and produced little "metabolic" water. The amount of water required to prevent loss of body weight under experimental conditions was known, but whether this was sufficient for optimum health was another question. Loss of water from lungs and skin and by faeces could not be greatly modified. Experiments indicated that uness a person had a total water intake from drink and food of over 1 litre a day desiccation would take place, becoming progressively worse and eventually ending in death. In some M.R.C. experiments during the war volunteers went from Tuesday evening to Saturday morning with no water and with a dry diet. With no fluid intake the urine output was 0·5 litre a day. As the experiment proceeded the salt content in the urine fell to 1 g. per day. Abnormalities began to show themselves on the third day of the experiment. As for sensation, thirst was not so evident as might have been expected; irritability and a disinclination for food were shown. The giving of 4 oz. (114 ml.) of water a day had no noticeable effect on urine output; it was more tantalizing than anything else. A little more effect was apparent with 8 oz. (227 ml.), which gave a rinse-out, but not until 1 litre was given was any real effect obtained. With no water intake desiccation depended on loss of weight. The results of German experiments in concentration camps showed that death took place usually after a fortnight, but these had to be taken with reserve, for the subjects were not co-operative. For example, they were found licking the swabs after the floor had been cleaned. In temperate climates death would probably take place in ten days if no water were drunk.

Observations on the Sprue Syndrome

Shane and Deyke (*Canad. M.A.J.*, **55**:448, 1946) write that the diagnostic criteria of the sprue syndrome are: (1) steatorrhea (always present); (2) wasting (always present); (3) flat glucose tolerance curve (almost always); (4) macrocytic anæmia (relatively constant finding); (5) hypochlorhydria (very frequently but not always present); (6) radiologic evidence of disturbed small bowel pattern; and (7) excess total fat (but normal fatty acids) in fæces.

The chronic diarrhœa with resultant faulty fat absorption and disturbed bowel pattern which is frequently seen may perhaps be recognized as "secondary" sprue when hæmatopoietic derangement is absent. Ultimately the case of "secondary" sprue may become a case of "primary" sprue.

Therapy is aimed at restoring nutritional deficiencies. High protein-carbohydrate diet is essential, fat is not. Parenteral feeding may be necessary where absorption is very much impaired. With improvement in bowel function, fat may be added to the diet in gradual stages. Adequate liver extract administration is important for both the gastrointestinal condition and the hæmatologic picture. Parenteral administration of the fat soluble vitamins A.D., and K is necessary.

Backache

Burns and Young (*Lancet*, **1**:623, 1947) write that persistent or recurrent low backache commonly arises from a lesion of an intervertebral disk or the annulus fibrosus. The other causes can nearly always be diagnosed by straight radiography. When disk lesions get worse the patient usually develops sciatica.

Operation is the rational treatment for all cases of severe backache due to disk lesions and will cure nearly every case. The operation is free from danger, so the inconveniences of operation must be balanced against those of the backache.

In cases not severe enough to justify operation, all other treatments have a limited effect, except rest and time, which will cure some of them.

Of 310 cases of sciatica due to disk lesions operated in 1941-45, a follow-up has shown that 80% are still symptomless.

Anaesthesia for Thoracoplasty

Opinion is still divided on the best anæsthetic for thoracoplasty. At a recent joint meeting of the Tuberculosis Association and the anæsthetics section of the Royal Society of Medicine the advocates of local anæsthesia pointed to the advantages of retention of the cough reflex, absence of explosion risk, and low toxicity of the anæsthetic (though whether this holds true when large amounts are used may be doubted). Its opponents, on the other hand, spoke of the mental trauma suffered by the patient unless sedatives are given in doses large enough to produce virtually general anæsthesia.

The technique of local anæsthesia takes time and no little skill; the intercostal nerves must be blocked as well as the brachial plexus, while some operators block the cervical plexus and the vagi; and all this amounts to a searching anatomical exercise. General anæsthesia is less spectacular, but the patient is quiet, and he has no memory of what is otherwise at best an uncomfortable experience. Paradoxical movements can be controlled, secretions can be removed by suction, and hæmorrhage in the chest wall can be minimised by infiltration with adrenaline. It is evident that equally good results are obtained by local and general anæsthesia, so long as the methods are well used—*Lancet*, **1**:643, 1947.

Combined Penicillin and Sulphonamide Treatment of Peritonitis

Brown (*Am. J. Surg.*, **73**:56, 1947) combined sulphonamides and penicillin intraperitoneally in patients with perforated gangrenous appendicitis with peritoneal soiling and peritonitis. The author has operated on and treated by combined chemotherapy 7 patients with acute gangrenous perforated appendicitis with diffuse peritonitis. There were no deaths, and the hospital morbidity rate averaged twelve to eighteen days. The author concludes that the combined used of sulfonamides and penicillin is justified by the increased rate of recovery and decreased secondary complications of appendical peritonitis.

Roentgen Therapy in Cancer of the Larynx

Lenz (*J.A.M.A.*, **134**:118, 1947) writes that rœntgen therapy in early cancer of the cords gives as high a cure rate and a better voice than laryngofissure. He recommends rœntgen therapy in all cancers of the vocal cord except when the cancer has extended subglottically or into the arytenoid cartilage. In these cases he prefers laryngectomy followed

by rœntgen therapy if clinically there is persisting cancer or if microscopic examination of the laryngectomy specimen shows that the removal was incomplete. Rœntgen therapy in cordal cancer with definite fixation of the arytenoid cartilage has succeeded in a small number of cases but should be substituted for laryngectomy only if there are valid reasons for avoiding operation. If the arytenoid is partially movable a trial with rœntgen therapy is indicated. If rœntgen therapy fails, laryngectomy can be done without fear of delayed healing, provided treatment has been properly administered. For cancers of the epiglottis, ventricular band and anterior portion of the aryepiglottic folds rœntgen therapy should be employed even after fixation of the arytenoids and the occurrence of lymph node metastases.

Cancer of the piriform sinus usually invades the arytenoid cartilage and early metastasizes to the cervical lymph nodes. Rœntgen therapy has failed to cure most of these cancers. Laryngectomy and postoperative rœntgen therapy might yield better results.

Prognosis is grave when cancer of the cord or piriform sinus has metastasized to lymph nodes. If movable they should be radically resected and, if fixed, treated by radium or x-rays. Prognosis is less serious if these metastases are secondary to cancer of the epiglottis or band. These should receive rœntgen therapy.

Glaucoma Following Ingestion of Sulphathiazole

Fritz and Kesert (*Am. J. Ophth.*, **30**:197, 1947) report the history of a woman aged 24 who came to the eye clinic April 11, 1945 complaining of itching, light sensitivity and burning of both eyes. The patient though she was sensitive to sulphathiazole, having developed red, burning eyes following the ingestion of sulphathiazole prescribed for a sore throat in August 1944. She had reported this to the medical officer who had seen her in her unit dispensary because of a sore throat on April 10, 1945, but he told her to try the drug again. On April 13 her eyes had the typical appearance of acute congestive glaucoma. Tension was 50 and 60 mm. respectively. Treatment with physostigmine salicylate was instituted and was discontinued on April 18. From that date until her discharge on April 21 tension remained 22 mm. in each eye and the eyes continued to improve, until they were considered normal on the day of discharge.

Eye Symptoms in Acute Anterior Poliomyelitis

Kindt and Knudtzon (*Acta Ophth.*, **24**:195, 1946, Ref. *J.A.M.A.* **134**:214, 1947) found that during the extensive epidemic of poliomyelitis in 1944, when 279 patients with this disease were admitted to the Frederiksberg Hospital, a rather large number had eye symptoms. Of the 37 patients presenting symptoms of the brain stem, 23 had eye symptoms. In 20 of the 23 patients the symptom which occasioned the summoning of the eye specialist was diplopia or, in a few cases, dimmed vision or flickering before the eyes. Double vision was constant or periodic in most cases. Paresis of the eye muscles was found in only 10 of the 20 patients who complained of double vision or dimmed vision. In 3 patients diplopia was one of the primary symptoms; in most of the others the eye symptoms appeared between the fourth and the eleventh day. All the ocular symptoms disappear completely or almost completely without special treatment in patients who survive the disease.

Seesaw Resuscicator for Asphyxia in the Newborn

Millen and Davies (*Am. J. Obstet. & Gynec.*, **52**:508, 1946) used the seesaw method described by Eve in asphyxia of a premature infant. In this method the position of the body is alternated frequently by rocking on a trestle, so as to allow the weight of the liver and abdominal contents to drop downward and thus pull air into the lungs when the head is raised and the feet lowered, and the reverse to take place, causing expulsion of air from the lungs when the head is lowered and the feet raised. The child's head was lowered, and immediately the familiar thick mucous plug was expelled through the child's nostrils. Alternate rocking of the child transferred and removed the weight of the abdominal viscera to the diaphragm and thereby established a nontraumatic pulmonary ventilation.

ALL-INDIA DENTAL CONFERENCE 1947

The All-India Dental Association celebrated its annual Conference on 14-3-47 at Delhi.

The following is the welcome address by Dr. A. C. Nayyar, D.E.D.P. (PARIS), Chairman, Reception Committee, A.I.D.C. 1947:

Hon'ble Mr. Gazanfar Ali Khan, Guests & Colleagues,

It is with feelings of pleasure and pride that on behalf of myself and of the Reception Committee, I welcome you to the second annual general meeting of the All-India Dental Conference.

During the past one year momentous decisions have been taken all over the world by important bodies or governments to ameliorate the sufferings of humanity or to give them greater scope for freedom. One of these, of immense importance, was the formation of the present Interim Government of India, whose, Member for Health, we have the honour to have in our midst today. With the advancing tide of world affairs it is but natural for India to keep pace with the outside world. And this can only be done by not allowing any sense of frustration to come over us. As in other matters of general importance, so in our dental profession, we must strive whole-heartedly to improve, as far as possible within our limitations, the lot of mankind.

We hope the dental bill which is to be put up by the Health Member, in the Legislative Assembly shortly will find deserving support from all and will be passed, thereby giving a recognised standing and dignity to our profession which, alas, it lacks at present as a result of this lack of Legal backing. After the bill is passed as law, we hope the Government of India will then be good enough to implement the suggestions of the Bhore Committee plan in so far as it concerns our profession.

We who have had training in Dental Science know how essential this science is to the welfare of human beings. A major portion of the teeming millions of India have never known what dentistry is and the benefit one can derive from that knowledge. Such knowledge can well be spread throughout the length and breadth of India by opening out dental colleges that are staffed by competent members of our pro-

fession. All this will no doubt take time but a beginning must be made, the sooner we make it the better.

Our president Dr. R. Ahmed has, through personal contacts, brought the Provincial Dental Associations in closer touch with the parent body and thereby increased the scope of mutual understanding.

We hope that this second annual conference will be a greater success than the one held last year.

I welcome you all once more.

* * * * * *

Presidential address by Dr. R. Ahmed, D.D.S., F.I.C.D., President, All India Dental Association:

I thank you for kindly re-electing me as the president of the Association for the ensuing year. I can assure you that I will do my best to forward the cause of dental science and of the profession to the best of my humble ability.

The Association has just passed through its first year of existence. The phenomenal progress it has made is a good augury for the future. Due to the energy and enthusiasm of our Hon. Gen. Secy., Dr. N. N. Bery we have now 26 branches, on almost every province of India and total membership has risen from 200 in February, 1946 to about 1,000 in February, 1947.

As far as the progress of dental education and profession is concerned the Association has rightly put the enactment of an All-India Dental Act in the forefront of the programme. As you are aware the draft Bill has been prepared and is in the process of introduction into the Central Assembly. To an assembly of dental surgeons, I need not recapitulate all the reasons why the enactment of such a measure is the prime requisite of progress in the dental field. But on one point I would like to stress. Unless the future entrants to the profession are made to come through the recognized dental training institutions in India, the profession will incur the risk of being filled by men who have had no scientific knowledge of dentistry. We cannot make the dental profession one of the learned professions, unless the future recruits to our ranks come fully equipped with scientific training. Time was when the apprenticeship system served its purpose but in the present age, it has no function. Therefore in the legislative enactment we are going to have the most important provision which should be that after a stated period, all persons who desire to come on the dental register must have certain minimum qualifications. The argument that we have not sufficient number of dentists to meet the needs of our huge continent will have to be met. All the people over the world are basing their lives on the development of science and it would be reactionary on our part if we did not accept what was best from the scientific point of view. We cannot accept the second best method in this age. In the dental field we must have the world's best and in order to do that we must go through a limited transitional period. Till such times when all our dental schools begin to function and prepare students to meet the total requirements of the country we must be prepared to go slow. If the Bhore Committee recommendations are even partly implemented, great impetus will be given to dental education and we will be able to meet the arguments of all pessimists that because we have not sufficient dental schools, we should still allow quacks and charlatans to enter a scientific profession. Therefore as one of the first target we must consolidate all our efforts on the enactment of a comprehensive Dental Act by which the future of the profession may be assured. I would strongly urge the members of the profession to be alive to this important necessity and do whatever they can individually and collectively for the achievement of this first objective.

Our next objective is the increase in the number of dental colleges in the country. Four dental colleges in a continent of 400 million is a matter of shame. Every medical institution in India must have an associated dental college and for this purpose we must bend our efforts. Unless a stream of qualified dentists are turned out from our colleges, we cannot meet the arguments of those who say that for the present we must be satisfied with those who can render dental service to the masses at a cheap rate, irrespective of whether they have any scientific training or not. That they are a menace to our public will not be realized till we can prove that by scientific dental training we can do inestimable service to all of our health programmes. Our public and the health authorities must be made to realize that any public health programme without dental service is incomplete. This we can do only when we train up a sufficient number of dentists to meet our requirements. How tremendous the problem is, can be gauged from the fact that in 1947 we turn out at the most 60 to 70 qualified dentists from our existing four dental colleges. For the next five year period we must try to establish at least five new dental colleges besides the four we already have. Our final target for the next 25 years is the establishment of 25 dental colleges, affiliated to our Universities each capable of turning out 100 qualified dental surgeons every year total 2500 per year. No one is more conscious of the defects and handicaps of our present institutions than myself. These must be enlarged, modern equipment and apparatus installed and made into institutions worthy of our great country. At least 25 lacs for each of these institutions, as a capital expenditure, is required. Five lacs a year as a recurring expenditure is the minimum for each college, teaching 400 students in all the four years. This is a modest estimate. We must make our public and legislators realize that we are already late and scientific dental education can only be put in the background at great risk I do not like to take up your time in detailing the travails and vissicitudes of the early days of dental education in our country from 1920 onwards. Suffice it to say that the first government dental institution in India was not established till as late as 1936. This is a sufficient commentary. Now that we are on the eve of better days, I hope and pray that our governments will not lose sight of the elementary fact that no Public Health measure is complete without dental service to the masses.

The next problem we have to tackle is the obtaining of the right type and number of dental educators. At the representation of our Association the Government of India have decided to grant six scholarships this year for post-graduate dental studies abroad. We must see that this number is increased from year to year, so that there may not be dearth of dental teachers as the number of dental colleges increases. Another suggestion that has been made by this Association is to have a dental institute attached to the proposed All-India Medical Institute, in New Delhi. This Dental Institute, when established, will offer opportunities for post graduate studies in dentistry, and thus help to turn out dental educators so

urgently required. It will also be the nucleus of dental research in India. We hope this scheme will be accepted by the Government of India and thus further the evolution of dental education in the country along right lines.

After we have a dental legislation, dental education will follow. But what is the ultimate aim? The aim is that in course of time we desire that the benefits of modern dentistry may be brought to the service of the mass of our fellow citizens. Whether we want it or not Medicine and Dentistry will have to be socialized and Public Health authorities will have to see that every citizen gets the benefit of all the advancement we have made in preventive and curative medicine and dentistry. We can only come to this stage provided we have the requisite personnel. We want nothing but the best for our people. And if this is the correct viewpoint, we cannot but follow the programme I have outlined above. As I have mentioned before, the difficulties we have to overcome are many and varied. But we have to face them boldly and meet out short-sighted critics with the logic of incontrovertible facts.

Coming now to our own Association affairs. I must first of all congratulate all our office-bearers for taking such a great interest in the infant Association. To hold five Central Council meetings during a year, with members coming to Delhi from Madras and Peshawar, at their own expense, is an achievement to my mind. But this is not enough. Our branches must increase, our membership must increase. We can do so if every-one of our members get the missionary spirit. I would request all of our members to realize that our journal must be made into a monthly from a quarterly publication, dental research must be encouraged and financially helped, a Council on Dental Therapeutics established, dental hygiene programmes initiated; insurance of life, accident and old age should be inaugurated. These are only a few of the activities of an organization like ours. Our active Hon. General Secretary Dr. N. N. Bery is already busy with some of the items I have mentioned above, but his hands may be strengthened by increasing your cooperation with your branch or local organization. I would like to add one word with regard to our associate members. I understand the heart burning that prevails amongst a section of our associate members but I want them to realize that their interest is safe in our hands and that the All-India Dental Association is an organization which will do the maximum of good to the largest number and it would be to their self-interest to be associated with the largest body of organized dentistry. Unity is strength.

I would like to put on record the consensus of opinion of the members of this Association that the time has arrived to inaugurate a provincial dental service, similar to the provincial medical service in every province. In every hospital, government or private, there must be one more resident and full time dental surgeon to give free dental treatment to indoor and out-door patients. This development is taking too long in coming. I would like to take this opportunity of bringing this matter to the notice of all our provincial medical authorities. At present there would be no difficulty in obtaining the requisite personnel as a large number of qualified dentists have been released from the Indian Army Dental Corps and their services may be availed of. A beginning should be made and the sooner it is done, better would it be for the public health of the province.

Regarding the Indian Army Dental Corps, we are glad to learn that it has been decided to keep the Corps on a permanent basis. We do not know the details of the scheme, but it must be pointed out that if we are to be anywhere near the British or the U. S. A. army standard with regard to dental relief and treatment a proportion of 1 dental officer to every 500 men is the minimum that will have any chance of being effective. The benefits of dental prosthetist must also be made available free of charge to all the ranks of the Indian Army, Navy and Air Force.

The establishment of the A. I. D. A. has been a landmark in the progress of the dental profession in Indit. The work before us is arduous but we are lucky to have in our midst a batch of sincere workers who are giving a lot of their time and energy for the cause we represent. I desire to express on behalf of all of you our thanks for the unselfish work they are doing. I hope you will all cooperate with them in the pioneer work they are engaged in. I have every faith in the future of the dental profession in India and I am convinced, we in our humble sphere, will do all we can so that India might develop and contribute her share in the progress of dental science and profession in the world.

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Annual report by Dr. N. N. Berry, D.D.S., D.E.D.P., Z.D.S., F.I.C.D., Hony. General Secretary:

Mr. President and Gentlemen,

It is very great pleasure to see you all assembled here to deliberate on our 2nd Annual Conference.

The All-India Dental Association came into existence in January 1946 to organise the science and practice of dentistry in India in accordance with the highest international standards and provide a well regulated dental service for the people of India both in the town and villages. Before 1946 the profession was speaking with too many voices with independent Associations in Bombay, Calcutta, Lahore, Delhi and Poona, and the Association owes a deep debt of gratitude to those selfless band of pioneers of dentistry who, in spite of all the terrible handicaps placed in their way, succeeded in forming the All-India Dental Association to accomplish the much needed co-ordination and to make it the mouth-piece of the profession in all matters connected with dentistry. The success achieved in so short a period speaks for itself and it will be no exaggeration to say that in the not distant future our organisation will be the only recognised body whose advice and guidance will be always sought whenever any question relating to dentstry crops up.

Strength—On the day of the inauguration of the All-India Dental Conference on January 14, 1946 we had only 132 members on our rolls. We can now boast of nearly 1,000 members, which in such a short period of one year is really creditable. It is hoped that with your help and co-operation our strength will grow every day and by the time we meet next we may be able to present to the world a picture bringing all the dentists practising in the country within our fold.

Branches—Soon after the last Annual Conference, many branches, local and provincial, were formed, and today we have in all 25 branches spread all over the country. For a vast sub-continent like India this figure is really small, and with our continued efforts it may not be long before we have branches in all the important towns and cities of the country.

I appeal to the members of the profession who have assembled here, when they go back to their respective provinces, to redouble their efforts in opening out branches wherever practicable so that the aims and objects of the Association will be known in every nook and corner of the country.

President's Tour.—During 1946, our President, Dr. Ahmed, made a tour of South India, Hyderabad (Deccan), Central India and the Punjab, and wherever he went he was received with open arms and with great enthusiasm. By his personal contact with the profession wherever he went he was able to enrol many new members, organise new branches, and dentistry which was dormant in many places awakened to its importance. The fact that he has been re-elected President for the second year clearly indicates the confidence and trust reposed on the head that guides the destinies of the Association. Let us all hope that the year 1947 will see still greater strides being made in the activities of our Association under the able guidance of our worthy President.

Indian Dental Journal—The Indian Dental Journal became the mouth-piece and official organ of the Association with the Special Conference Number in February 1946, to represent the desires, wishes, aims and ambitions of the organised dental profession in India. The conduct of the Journal is entrusted to a Journal Committee and this committee was expanded during the year to infuse new blood. There were three more issues of the Journal namely April, July and October, in the year under review. It is our intention to make the Journal appear once in two months instead of quarterly, as at present, but the question has been postponed to next year and it is hoped by that time we will be able to realise this object. We appeal to members to give handsome donations to the Journal Fund to make this possible. The number of members to whom the Journal was sent free was 700 at the end of the year, and on the exchange list there are about 120 leading dental journals of the world. Dr. R. Ahmed continues his dual role as President of the Association and Editor of the Journal.

Associate Members.—As you are all aware the majority of our members are Associates, not regularly qualified, and as the object we have set before us is to see the profession attain international standards, we have not given them the same privileges as to ordinary members who are qualified and who are guiding the destinies of the Association to this cherished goal. Rightly or wrongly, these members have a feeling that they are not given enough opportunities to take their share in shaping the policy and lately they have become more vociferous. If, as they demand, they are given equal rights as ordinary members, surely the very object of the Association will be defeated, as they, being in a majority, will be able to occupy all seats of power and the really qualified members will be mere spectators unable to do anything for the Association. The aim of the Association is to educate these unqualified members so that in the years to come they may attain ethical and international standards in their profession. The Central Council has been very generous towards the Associate Members, and wherever practicable they have allowed Associate Members to become regular members consistent with the dignity of the profession, and it is fervently hoped that these Associate Members will be guided by the principle, "In unity lies strength", and be a source of strength rather than fritter away their energies in unnecessary controversy and undermine the aims and objects of the Association. The branches have been authorised to relax the rules regarding recommendation of Associate members for ordinary members in special cases and circumstances.

Scrutinising Committee.—By a resolution of the Central Council on 12th October, 1946, all branches were authorised to appoint Scrutinizing Sub-Committees to go into the eligibility of each applicant for membership of the Association and in doubtful cases refer the same to the Central Scrutinizing Committee, who will recommend to the Central Council for final decision. The Central Scrutinising Committee held three meetings in the year and many names were recommended for ordinary membership of the Association. The appointment of Scrutinizing Committee, it is hoped, will completely eliminate chances of those who, though unqualified, want to become regular members of the Association by dubious means.

Official Year.—The financial year of the Association was changed from 1st April of one year to 31st March of the year following to 1st January to 31st December.

Dental Bill.—Small countries like Ceylon, West Indies, East and West Africa, all have dental legislation to their credit whereas a sub-continent like India was left at the mercy of quacks and charlatans. The Central Council representing the office-bearers of the Association and representatives of provinces got into informal discussions with the Health Department of the Government of India, as a result of which the Association was requested to frame a Dental Bill for the proper control and regulation of dental practice. The Bill in its final form, with the recommendations of Provincial Governments, which is now with the Health Department of the Government of India, and which incorporates most of the recommendations of the Association. We have been given the assurance that the Bill will be introduced in the present budget session of the Central Legislature. We are trying our utmost to see that the labour and time spent on its compilation will bear fruit in the shape of a Dental Act on the Statute Book as soon as practicable. As the Bill is a non-controversial measure, it is expected that it will be passed in the Legislature without further avoidable delay.

Insurance of Dentists.—Dr. Lakshmanan and Dr. Merchant were entrusted with the task of submitting a report regarding insurance of dentists at concession rates after contacting various insurance companies in Bombay.

Negotiations are already under way whereby our ordinary members may be able to insure against charges of malpractice or damages by becoming members of the London & Counties Medical Protection Society, London.

Our request to the Dentists' Provident Society to take in our members affiliated to the British Dental Association has, I regret to report, been turned down as the Dentists' Provident Society only entertains members who are practising in England and even those who are practising there and are full members of the Association have to give up membership when they go overseas.

Scholarships.—As you are aware, the Government of India had sanctioned about 50 scholarships for Indian Medical Graduates in 1946 to go abroad for higher studies under the recommendations of the Bhore Committee. On representation by the All-India Dental Association the Government have

agreed to the grant of six scholarships for higher training abroad in dentistry for this year and we hope to increase the number in subsequent years.

Dental Institute.—Under the recommendations of the Bhore Committee the Government of India has decided to set up an All-India Medical Institute in Delhi. Efforts have been made by the Association to see that a Dental Department is organised in the proposed All-India Medical Institute. At the request of the Secretary, Advisory Committee, All-India Medical Institute, a scheme on behalf of the Association has already been submitted.

Approach to Provincial Governments—At present we have only four Dental Colleges in India which are quite insufficient to cater to the needs of those who want to take dentistry as a career, and we have approached Provincial Governments where medical colleges already exist to provide a dental wing to these colleges, and the response is encouraging. It is hoped in the post-war era the country will be provided with more facilities for the study of dentistry, and our Association have a noble part to play in this connection.

Members Affiliated to British Dental Association—As you are all already aware, our Association has been affiliated to the British Dental Association and during the year many of our members became affiliated to the British Dental Association with its attendant privileges, though our efforts to become members of the Dentists' Provident Society have met with no success as already mentioned.

The affiliated members, 131 today, among other privileges, get free the British Dental Journal regularly. It may not be out of place to quote here a short note of appreciation in the British Dental Journal about our Association:—

"All India Dental Association—This Association, the newest of the affiliated Dental Associations has recently set up what must be a record in the history of the Association, by forwarding a list of 119 new affiliated members. These members will be a very welcome addition to the ranks of the Association and will ensure an even wider promulgation of the policy of the Association in the fields of dental science and art, ethics and dental politics, than even before. It is sincerely hoped that this new and close association will prove both long and happy."

We are also under correspondence with them regarding the New Health Insurance Scheme in England and other matters pertaining to dentistry and we must record our appreciation for the unfailing courtesy and immediate attention that they give to all our queries.

Recognition of Indian Dental Schools in the U. K.—The question of recognition of the four existing Dental Colleges, in India by the Dental Board of U. K. was taken up with them, and so far only Demontmorency College of Dentistry, Lahore, has been recognised, which means that dental graduates from this college can sit for the L.D.S., R.C.S., examination immediately. Regarding the other three colleges, negotiations are still continuing.

Registration of Indian Dentists in the U.K.—I took up with the General Medical Council of the Dental Board the question of recognition of degrees recognised by the All-India Dental Association of Indian dentists practising in India under Section 10 No. 28 of the British Dental Act of 1878. The matter is still under correspondence.

Central Council—The Central Council of the Association met five times during 1946-47 and many important decisions were made to bring the aims and objects of the Association to the forefront. Representative members from many parts of the country came to attend the meetings of the Council at great personal inconvenience and at their own expense, and it is earnestly hoped the old as well as new members of the Council will serve the Association and give their unstinted support and co-operation in the great unfinished task that lies ahead of us.

Election of Persidents & Vice-Presidents—Dr. R. Ahmed has been unanimously elected as President for the year 1947 and Drs. V. M. Desai, S. K. Majumdar and M. K. Patel have been elected as Vice-Presidents with the majority vote. It is proposed at the Annual General Meeting to change the constitution and have the President-elect, as in America and the United Kingdom, so that there may be a continuity in the policy and conduct of the affairs of the Association. I am quite confident that the Gentral Meeting shall accede to the request of the Central Council. We all hope that during Dr. Ahmed's second term of office as President of the All-India Dental Association the dental Bill will be enacted into law and the particular anxieties of the President and the Hony. General Secretary and the members in general in this connection will be allayed.

VII ALL-INDIA PHARMACEUTICAL CONFERENCE

The Seventh All-India Pharmaceutical Conference was held on the 3rd, 4th and 5th of January 1947 in the Physics Lecture Theatre, University Buildings, Delhi.

Dr. J. N. Raq, O.B.E., D.SC., F,R,I,C., F,N,I., opened the Conference at 11 A.M. on the 3rd January 1947 and delivered his welcome address. Mr. M. L. Schroff, A.B. (Hons.), M.SC. (M.I.T.), then read his presidential address after which the meeting was adjourned.

On the 4th of January at 2 p.m. the Annual General Body Meeting took place. At 3 p.m. a symposium on anti-malarials was held. Dr. U. P. Basu was in the chair. Dr. J. N. Ray, Dr. B. Mukherji, Dr. T. N. Ghose, Dr. A. N. Bose, Mr. S. Mukherjee, Mr. M. V. Patel read papers. Dr. P. C. Guha and Major-General Covell who could not attend the symposium personally sent paper to be read. Discussion followed each paper.

Open session of the Conference was held at 2-15 P.M. on the 5th January 1947. Mr. M. L. Schroff was in the chair.

The following resolutions were passed:

1. This session of the A. I. Pharmaceutical Conference places on record its deep sense of sorrow and grief at the sad passing away of Mahamana Pandit Madan Mohan Malviya, Rector of the Benares Hindu University, who was not only a great political and religious leader and educationist but who for the first time in this country conceived of starting University Pharmaceutical education, when Pharmaceutics as an organised science was almost unknown in this land. It was mainly due to his vision that Pharmaceutical education has

made such rapid strides in India. In him the country has lost the Father of the Pharmaceutical education. This Conference sends its heartfelt condolences to his sons and the bereaved family.

2. This session of the All-India Pharmaceutical Conference views with great concern the rising tide of foreign pharmaceutical concerns in India with or without the style of "India Ltd." and requests the Government of India to take necessary steps at the earliest so that the country becomes self-dependent in respect of public health needs and the vital needs of the country are supplied by national controlled organisations.

3. Inasmuch as this Conference has received a report that the Government of India is considering the postponement of the enforcement of the Drugs Rules 1945 in so far as the Patent and Proprietary medicines are concerned, in order to placate a group of foreign proprietary medicine manufacturers, who are trying to establish themselves in India, this Conference, in the interests of national health, requests the Government of India to enforce the Drugs Rules 1945 right away without any further delay.

4. This Conference notes with alarm the increase of false, misleading and exaggerated advertisements of patent and proprietary remedies both foreign and Indian in the daily press, cinemas and public posters and therefore requests the Central and Provincial Governments to undertake legislation to control such undesirable practices in the interests of the public health of the country.

5. This Conference requests the Councils of the Indian Medical Association and the Indian Pharmaceutical Association to appoint a joint committee to formulate plans and to take necessary action for recognition of only ethical patent and proprietary remedies for the guidance of the medical and the pharmaceutical professions.

6. This Conference wishes to draw the attention of the Central and the Provincial Governments to the disadvantages under which the Indian manufacturerers suffer on account of (1) the excise policies of the various Provincial Governments being different from the excise policy of the Central Government which, on the other hand, act to the advantage of the imported spirituous medicines; (2) there being no supply of industrial alcohol free of excise duty for the chemical and pharmaceutical industry as is the practice in the various countries of the world.

7. This Conference regards the continuance of the use of proof gallon in expressing strengths of alcoholic preparations and charging of duty on the basis of proof content as unscientific and mediaeval. This Conference, therefore, requests the Central and Provincial Governments to do away with the present practice and make Excise laws scientific, uniform and up-to-date.

8. This Conference is of the opinion that the multiplicity of names in standard drugs is dangerous and unnecessary and hence, it resolves that the authorities concerned be requested to prevent the continuance of such practice in the best interests of the public health of the country.

9. This Conference wishes to draw the attention of the Government to the severe Excise restrictions placed on the supply of Rectified Spirit, Methylated Spirit (and preparations containing them) to hospitals, teaching and research institutions and requests the Government to simplify the regulations controlling the supply of spirit to such institutions.

10. Resolved further that the Government of India be requested to select only pharmacy graduates of Indian Universities for scholarships for studies overseas in advanced Pharmacy, Pharmacognosy or Pharmaceutical Chemistry as the British and the other Universities do not admit students for higher studies in Pharmaceutical subjects unless they possess basic Pharmaceutical qualifications.

11. This Conference requests the Central and the Provincial Governments to appoint adequate number of duly qualified pharmaceutical chemists as inspectors under the Drugs Act in order that the above Act may be enforced efficiently in every province.

12. In view of the fact that malaria is one of the greatest scourges of India as far as mortality and morbidity are concerned, this conference is of the opinion that more intensive drug research for the prevention and treatment of malaria should be taken up by the State. The claims of the indigenous system of materia medica have not been thoroughly explored according to recent technique and there seems clear need for reinvestigation in this field of indigenous anti-malarial remedies along modern scientific lines. The Conference, therefore, requests the Government of India to appoint a Board of malarial research representing pharmaceutical chemists, pharmacologists and clinicians to undertake the investigation of indigenous remedies and newer synthetic drugs.

Dr. B. Mukherji took the chair when Model courses in pharmaceutics were taken up for discussion. A committee to frame syllabuses in pharmacy which could serve as models for various institutions taking up the teaching of pharmacy in India was appointed at the Sixth Annual Conference. After the preliminary report of this committee was presented, general discussion took place. Many people took part. Dr. B. Mukherji closed the discussion, requesting all those who took part in the discussion and others to send their recommendations in writing to Mr. B. V. Patel, the convener of the committee.

In the scientific session which followed, Mr. G. K. Roy, M.SC.TECH. (Pharmaceutics) (Andhra), read a paper on A rapid colorimetric method for the estimation of acriflavine and allied compounds in pharmaceutical preparations.

NOTES AND NEWS

SOUTH INDIAN PROVINCIAL MEDICAL CONERENCE

It has been decided to hold the Second South Indian Provincial Conference at Coimbatore during the 17th., 18th. and 19th. of October, 1947. As usual the publication of a souvenir and holding of an exhibition are also arranged.

CONTROL OF ANTIBIOTICS

The Penicillin Bill, presented in the House of Lords on March 5 by Lord Listowel, makes it an offence to sell or supply penicillin (or similar substances included by regulations) to the public except by or under the direction of a doctor, dentist, or veterinary surgeon, or by a chemist on the prescription of a doctor, dentist, or veterinary surgeon. The Government's advisers think that free access to penicillin would be dangerous to the public health, and for this reason it has

been decided to continue the measures of control made under the Defence Regulations by the Minister of Supply, even though there is now enough penicillin for all home purposes and a surplus for export. The main danger is thought to be that indiscriminate and inadequate dosage might lead to the production of insensitive organisms. Penicillin might also be used for the self-treatment of venereal diseases, which would add greatly to the difficulty of preventing their spread.

The Bill applies only to the supply of penicillin to the public. It does not impose any controls on wholesale dealings or exports. Power is given to the Health Ministers to make regulations bringing under the same control any "other antimicrobial organic substances produced by living organisms," after consultation with the Medical Research Council.—*Lancet.*

BONES IN THE BANK

A "bone bank," perhaps the first of its kind, has been set up at the Geisenger Memorial Hospital, Pennsylvania. Dr. Leonard Bush, head of the orthopædic department, has explained that surplus bone from such operations as osteotomies can be preserved indefinitely at a temperature of 10°F, and it will provide material for chip grafts, so eliminating one stage of the grafting operation. The value of a bone bank must depend on the kind of material available for storage, and this is likely to be limited to fragments which are partly compact and partly spongy. For filling in defects after trauma or the excision of tumours or cysts, these fragments will be quite satisfactory; for, though heterogenous skin grafts or nerve grafts are unsuitable for transplantation after storage on account of the foreign protein reaction they excite, with chip grafts it is a matter of indifference whether the bone survives or not. On the other hand, the special properties of living cancellous bone and of massive rigid cortical grafts will still make it desirable to obtain these from the patient himself.—*Lancet,* **1**:493, 1947.

RESEARCH IN GERIATRICS

The trustees of the Nuffield Foundation have offered the University of Cambridge the sum of $80,000, with a possible further $72,000, for research under Professor F. C. Bartlett at the psychologic laboratory into the causes and results of aging, with particular reference to adults and to the characteristics and changes of human function associated with different age groups. It is proposed that the gift shall include $8,000 for capital outlay, with a further $24,000 a year for three years and a possible renewal for another three years.

WATTS EDEN TRAVELLING FELLOWSHIPS

Dr. Thomas Watts Eden, who died on September, 22, 1946, set aside under the terms of his will two sums, each of £10,000 free of duty, to found travelling fellowships. These two fellowships will be created after the death of his widow. One is to encourage the study of obstetrics and gynæcology, the other the study of infancy and early childhood in health and disease. For thirty years or more Dr. Watts Eden was one of the foremost obstetricians and gynæcologists in London hospital and consulting practice. He distrusted that narrow specialism which he called "the keyhole view" of medicine and then stressed the need for study of the healthy infant and child, and particularly in relation to the result of antenatal and postnatal care. The conditions under which these two new fellowships are to be founded reflect his views. In due course the funds set aside by his trustees will be transferred to the Royal College of Physicians and to the Royal College of Obstetricians and Gynæcologists. The President and senior officers of the Colleges with others, are to be the judges making the awards. Candidates will be men or women graduates, whether members of the College concerned or not, of not less than two years' standing of any approved university in the British Empire and Commonwealth. Each fellowship will be for a period not exceeding three years. The awards will be made according to the academic progress of a candidate before graduating and in the light also of his or her attainments during the postgraduate period. Ten years after the first award the conditions may be varied.—*Brit. M. J.*, **1**:496, 1947.

SCIENTIFIC MEDICAL SOCIETIES IN THE USSR

Dr. Wolf Fried writes:

There are nearly 140,000 physicians in the USSR. To gain an idea of the work carried through in the Soviet epoch for training medical workers it will be enough to recall that before the October, 1917 Revolution there were only 20,000 physicians in Russia.

But it is not only a question of numbers, of the fact that there are now seven times more doctors than in Tsarist Russia. Of no less importance is their mental outlook, the level of their knowledge and their constant perfection. A physician who rests content with only the education he received in his student days is a poor healer.

Under Tsarism there were medical scientific societies only in the capital and in some of the big cities. Afraid of any development of public activities, the Tsarist Government created all sorts of obstacle to the union of doctors even in a purely scientific society. It took no care at all that the latest achievements of medical science should become the possession of all the medical practitioners.

It is common knowledge that medicine has greatly developed in the USSR. Soviet investigators seeking for effective means of improving public health and prolonging life occupy an honoured place among the foremost scientists of the world. A. Abrikosov, N. Burdenko, L. Stern, L. Orbeli, E. Pavlovsky, N. Aluyeva, G. Roskin, A. Speranski, O. Magidson, V. Filatov and many other scientists are the pride of Soviet medicine. Their works are known throughout the world. The results of their research are extensively utilized in the Soviet Union not only in special clinics, but also in all medical institutions, by all urban and rural doctors. The achievements of foreign scientists are likewise rapidly introduced in Soviet medical practice.

The foundation of the Academy of Medical Sciences in 1944, the wide range of research work in numerous scientific-research institutes of which there are about 200 in the various republics and regions of the USSR, the scores of refresher courses, institutes for doctors—all this shows the immense importance attached to questions of the health of the people in the Soviet Union, to the broadening of the scientific basis of public health.

The Soviet Government demands from physicians and surgeons that they should constantly enhance their knowledge

and boldly apply the achievements of science in their medical and sanitary practice. That is why scientific medical associations have developed so extensively in the Soviet Union. Along with the refresher courses for doctors, these associations are called upon to see to it that no advanced idea in the field of medicine should be kept within a narrow circle, but should be embodied in deeds and, after scientific verification, should immediately be introduced into medical practice.

As a member of a scientific medical society every Soviet physician has the possibility of rapidly becoming acquainted with the latest achievements in medicine and in this way enhance the quality of his work. As a member of such a society he also has facilities for engaging in scientific research even when he works in a village.

Scientific medical societies in the USSR unite doctors in all specialities in all branches of Medicine. Specially well-known are the Soviet thereapeutic, surgical, pediatric, otolaryngological and other societies of doctors. The main form of work of these scientific societies are the plenary sessions at which scientific papers are read and clinical demonstrations given. Such meetings as a rule, take place once or twice a month, and are well attended. In those comparatively small towns, where there are few specialists, one local scientific society for all branches of medicine is organized. Of especially great significance are these local medical societies in places where there are no special scientific research institutions and where such societies, to all intents and purposes, are the only organizations capable of enhancing the qualifications of doctors and directing their scientific activities.

We may illustrate this by the example of the scientific society in the city of Ulianovsk on the Volga. A number of papers read by the members of this Society proved of considerable interest as they generalized the great exeperience of their authors. The report of Dr. Shefer, Surgeon of the Ulianovsk Hospital, on the results of 306 operations in the case of shot-wounds to nerves, has enriched the knowledge of the other local surgeons and has helped in the application of new and more effective surgical methods. The report of Riapolova, a roentgenologist, on the treatment of cancer, assisted in improving this important work in Ulianovsk Region. The communication of Dr. Smirnov, ophthalmologist, on the results of his 15 years practice has assisted in improving the system of prophylaxis and treatment of eye diseases.

There are no scientific institutes in the City of Pskov, where the German occupation has resulted in enormous destruction and has undermined the health of the population. A scientific medical society organized in that town has spread its influence over the entire region and is actively helping to improve public health. The meetings of this society are attended also by rural doctors who specially arrive for these gatherings from their districts. The society has organized a scientific medical library. Well-known Leningrad scientists often address meetings of the Pskov Medical Society.

In Siberia prominent representatives of local medical societies frequently travel by æroplane, sometimes for thousands of kilometers, to remote northern regions to participate in district scientific conferences of physicians and to help them improve the medical services.

The scientific society organized on the Pamir (Central Asia) in Khorog, centre of Gorno-Badakhshan Region, is studying the problems of the treatment of tick relapsing fever, goitre and other diseases prevalent in these places. The scientific societies of Soviet Tajikistan are rendering valuable assistance in this work of the Khorog Society.

The Shchadrinsk Medical Society is a characteristic example of the work of such associations in small Soviet towns. That society was organized in this small town in the Urals 25 years ago. Before the Revolution there were only five doctors in Shchadrinsk; today thirty physicians and surgeons are working in medical and prophylactic institutions in that town. The society inaugurated its activities by hearing reports of demonstrations, analysis of rare cases, etc. It gradually accumulated practical experience and extended the circle of its scientific interests. Some of the communications made at meetings of the Shchadrinsk Medical Society were in the nature of real scientific works. Such, for instance, were the papers on trachoma and measures for combating it, on the sanitary condition of the schools in the town, on the dialectical method and mechanistic trends in application to medicine.

A conference on questions of septic angina organized by the Schadrinsk Society attracted the attention of neighbouring districts. That conference was also attended by Prof. Ratner and Assistant Prof. Plotnikov from the Sverdlovsk Medical Institute.

During the recent World War the Shchadrinsk Society worked on war surgery and helped local physicians in the treatment of wounded soldiers. In general during the quarter of a century of its existence the Society has undoubtedly carried out valuable work which assisted in improving the medical service in that area.

Another local medical society, in the small town of Kovrov, Vladimir Region, recently celebrated its 25th anniversary. At the moment of its organization there were only 12 doctors in that town. The number of doctors in various specialities in Kovrov increased year by year. At first the society had thought of dividing into sections but this proved impracticable in a small town. Unified meetings gave much more to the small body of members of the Society. They widened the mental outlook of each doctor, and what is particularly important, helped him to follow the new trends not only in his own speciality but also in conterminous fields of medicine.

During the twenty-five years of its existence the society heard 380 scientific papers. The style of work of this society is characteristic. It plans its scientific activities and makes good use of the local medical institutions as a clinical base for such activities. At the meetings, carelessness and superficiality in investigation and diagnosis are criticised with particular severity. The Kovrov Scientific Medical Society has educated a good many scientific workers and medical practitioners.

Such educational work is conducted also by other scientific medical associations in the USSR. The best Soviet medical practitioners and hundreds of researchers in the field of medicine have come from this school which has the backing of the powerful Soviet state.

NEW DRUGS FOR T.B. AND TYPHUS

Miss Nancy Atkinson, a bacteriologist of the Institute of Medical and Veterinary Science, Adelaide ,South Australia) has extracted from mushrooms and toadstools new drugs that may prove effective in the fight against tuberculosis and typhus.

She found anti-bacterial activity in about 40 plants out of 450 flowering plants and more than 200 variety of mushrooms and toadstools examined by her.

In Psalliota sp (mushroom) and Cortinarius rotundisporus (toadstool) she found anti-bacterial activity against a wide range of bacteria, including the one that causes typhus. In Psalliota (Agaricus) sp, she found a substance which killed tuberculosis bacteria in a test tuue and attacked a wider range of bacteria than penicillin.

Encouraged by the laboratory results, Miss Atkinson plans to inject tuberculosis bacteria into guinea pigs and then to attempt to cure the animals with the mushroom extract. If these tests are successful, tubercular patients will be asked to volunteer for injection.

So far, Miss Atkinson has not been able to get enough mushrooms for this work but she is hoping to have two or three tons soon.

"Five pounds of mushrooms produce less than one pound of dried extract," says Miss Atkinson. "We get this by grinding the mushrooms(straining the thick brown fluid through muslin, and drying it by freezing in a vacuum at a temperature of 20° below zero. From 50 lb. of dried extract we hope to isolate about half an ounce of this new antiseptic.

Thus, we need about 250 lb. of mushrooms to get half an ounce of this new antiseptic, which may prove to be an entirely new chemical compound. We could use tons of them, and we will be appealing to the public for help."—*Medical Newsletter, Australia.*

LYSOZYME

According to a report of the Technology Review, an enzyme having the same activity as lysozyme found in the whites of hen's eggs and the tears of human eyes has recently been isolated from the latex of Central American trees of the Ficus germs. Lysozen as found in the white of the egg and in human tears is an enzyme well-known for its destructive action on bacteria by 'lying' or dissolving the bacterial cell well. Lysozen thus offers good protection to the embryo against bacteria penetrating the shell from outside during hatching and also helps in the preservation of eggs when used as human food. Its presence in the tears considerably helps in protecting the exposed and delicate eyes from invading bacteria.

Lysozmye found in the trees of Ficus germs, however, differs chemically from the one of animal origin mentioned. Moreover, its exact role in the plant has not yet been ascertained. It is believed that either it may act as an antibiotic or may play some role as a metabolic agent such as the polysaccharides of the bacterial cell wall do in plant metabolism.

What is important about the lysozyme is the possibility of its being used as a clinical antibiotic like penicillin or sterptomycin. Recently, this possibility has been suggested from several competent quarters, and should it materialize, it would mean a new kind of control of infection. The biological activity of lysozyme, like other enzymes and also the vitamins, has already been recognized and studied in mixed preparations. Now that it has been isolated in pure crystalline form, further studies regarding the chemical and biological behaviour of lysozyme appear to be in viting.—*Science & Culture.*

PHARMACOLOGY LABORATORY

The establishment of a Pharmacognosy Laboratory by the Government of India (Health Department) has been recently announced. It is located in the Indian Museum (1, Sudder Street, Calcutta).

The importance of pharmacognostic researches in India was visualized during World War II when India felt an acute shortage of imported drugs. Researches on the subject unearthed many new substitutes which have recognized in the pharmacopoeia, and the pharmacognostic characters of the drugs described in the 'Indian Pharmacopoeial List' (published by the Government of India) have been mentioned. The essential need for the establishment of this laboratory was further realized by the Government in connection with the formation of the 'Central Drugs Laboratory' and the enforcement of 'The Drugs Act, 1940.'

The work of the laboratory includes identification and evaluation of drugs either in crude or powdered form as well as problems of research in finding new substitutes, methods of collection, curing and storage of drugs, the influence of particular age, season and locality regarding the yield of maximum active principles, checking of adulteration of drugs and similar other problems.

The problem of cultivation of medicinal plants in India and introduction of foreign drug plants for acclimatization in this country and zonal plantation of medicinal plants are included in the programme of work of this laboratory.—*Science & Culture.*

ANTIBACTERIAL ACTION OF POLYPORIN

The success of the penicillin programme suggested Prof. S. R. Bose (Carmichael Medical College, Calcutta), a search for antibiotics among the Polypores, a group of higher fungi with the study of which Prof. Bose is now connected for more than a quarter of a century. Since May 1944, Prof. Bose has taken up a study of the antibacterial activity of the culture-filtrate of Polystictus sanguineus (collected from decomposed wood, logs and bamboos from India and not reported so far from Europe), and the filtrate is designated as 'polyporin'. (*vide Science and Culture,* October, 1945, p. 191).

The details of the experiments conducted on the culture of the fungus and collection of the antibacterial substance; on antibacterial action; on toxicity tests and animal experiments; on antibacterial titre in wood-destroying fungi; on chemical investigation and on concentration are detailed in the Bulletin of the Botanical Society of Bengal, April, 1947, pp. 71-80.

From the results of these experiments it has been found that the active substance is thermostabile and nonvolatile, but it is destroyed on prolonged heating with steam at 100°C in presence of alkali and acid. It is acidic in nature and fairly soluble in dry ether. The substance has not yet been obtained in a crystalline form. Further investigation to isolate the antibiotic in a purer form from the ether extract of the purified and concentrated culture fluid is in progress.

In the absence of polyporin of the highest purity, it is not yet possible to state exactly the part polyporin is destined to play in treatment of infectious diseases. But clinical trials with crude polyporin in Calcutta hospitals during 1944-46, are sufficiently encouraging to justify trials on larger varieties of cases or at least in cases where other methods have failed to produce any effective results. Polyporin has so far been found to produce no toxic effect.

Polyporin is susceptible to a wide list of organisms tested so far: Staphylococcus aureus, Streptococcus pyogenes, S. viridans, B. paratyphosus A, B. paratyphosus B, B. coli, V. choleræ, and B. flexner.

Striking results have been obtained with the following varieties of cases by local application of polyporin: (1) abscesses and boils; (2) carbuncles; (3) bed-sores; (4) eye infections; (5) ear, nose and throat infections; (6) different kinds of ulcers and (7) infected lymph glands.

Clinically polyporin has been tried orally in cholera cases in Carmichael Medical College Hospitals and the results are satisfactory. One ampoule of polyporin containing 3 c.c. of the crude filtrate, is administered orally every four hours. A larger number of trials have yet to be made to establish its efficacy.

Fifty-four cases of typhoid and paratyphoids have been treated in the same hospital and on some private cases of local medical practitioners with polyporin, among which 3 deaths are reported. Polyporin controls the temperature within a very short time and it lessens the toxicity and prevents complications like tympanitis, diarrhoea, haemorrhage etc. It further cuts short the period, if the administration is commenced early. —*Science & Culture.*

CORRESPONDENCE

"RESUSCITATION OF AYURVEDA"

Sir,—I solicit the favour of your publishing the following observations, I am impelled to make on Dr. D. N. Banerjee's article on the Resuscitation of Ayurveda. The doctor friend who must be more in touch with Ayurveda than the usual modern Medical Practitioner must have felt galled at the wonderful oration of my esteemed friend Rao Bahadur Dr. B. Tirumala Rao. The Rao Bahadur was only voicing forth in his inimitable style not only the sentiments of Professor Sigerist but also the opinions of all right thinking medical men in India. Even today there has appeared a thoughtful and equally impassioned speech in the *Hindu* (24-6-47) by Dr. T. S. S. Rajan, the Honourable Minister for Food and the Minister for Public Health in the first congress ministry on the imperative need for a scientific system of medicine in India. It is unfortunate that doctor Banerjee should bring in slyly an element of raillery into his article. If a doctor of the high calibre and level of Rao Bahadur Dr. Tirumala Rao points out any defects in the Ayurvedic system of Medicine, it is not because he is devoid of a patriotic sense, but it is due to a greater regard for the welfare of the community as a whole and a deep concern for the honour and efficiency of the medical profession. My friend Dr. Banerjee who would want little weight to be given to opinions expressed by men like the Professor, Lt. Col., Rao Bahadur and so on for their want of intimate knowledge of Ayurveda, subjects himself to the same criticism for the reason that he too does not claim to have a thorough knowledge of the Ayurvedic system of medicine. For a decade past my mind has been much occupied with thoughts regarding the unification of the divergent systems of medicine in India, and though one cannot be absolutely free from prejudices, I claim to look upon things dispassionately, because I have had a two year post-graduate training in the Govt. School of Indian Medicine, Madras.

No one denies that when the rest of the world was groping in the dark, Ayurveda in India must have flourished in all its glory, both in the field of medicine and in surgery. If it did so it was because of its maintaining a high scientific level, and an eager search for truth. Scientific knowledge, as it is evident to-day is not the monopoly of any particular clime or time. What the protagonists of the modern system of medicine now say is that medicine now taught and practised should completely satisfy the tests and demands of science. They do not claim either completeness or infallibility for the system they support, but this much can be said, namely, so far as it goes modern medicine is based upon experiment and research and can stand a test of the minutest scrutiny. One is aware that Ayurveda has a rich lore and that some of the medicines are wonderfully efficacious, when they are of a genuine make, but a votary of medicine cannot content himself with getting formulas by rote or learning the use of a few recipes. In his oration the Rao Bahadur rightly stresses the need for a unified system of medicine, united control and a uniform standard of medical education. They say half knowledge is dangerous. No where is it more dangerous than in the treatment of human ailments. A basic qualification for every medical man in the land must be the three things mentioned by the Rao Bahadur Dr. Tirumala Rao, namely, (1) the unity of approach, (2) the unity of standard, (3) the unity of control. The actual drugs used may be a matter of faith with the doctor, but so far as a study of the human system and pathology is concerned, there can be no divergence or diminution in instruction. Into this scheme may be brought in whatever and everything that is precious in the indigenous systems of medicine after a thorough research is made in medical laboratories. It is putting the clock back to ask the medical student of to-day to take all the doctrines and the principles underlying Ayurveda of old as gospel truth, without subjecting it to minute scrutiny and test. If such a course is adopted, people would flee from medical colleges and go in search of courses providing saner employment for their brains. My friend Dr. Banerjee disparagingly observes that the proportion of the modern medical men to the Ayurvedic Practitioners is negligibly small. This is due not to the unpopularity of modern medicine, but to the scant regard a foreign Government has had all along for the welfare of the people, by limiting the number of the medical colleges and making only a meagre provision for medical education. Is it not a common sight that thousands of young men of ambition and spirit of service are turned away for want of seats? The crying need of the day, therefore, is not for allowing any and every man who styles himself a doctor to practise medicine, but to provide as wide and increasing a scope as possible for the surging youth of the land to treat their felow men with understanding and skill.

The tridosha theory is made most of by my learned friend Dr. Banerjee. His main criticism is that the four critics of Ayurveda quoted by him failed to grasp the real meaning of the terms Vayu, Pitta and Kapha, owing to the use of faulty Engish translations. Not all critics of the Ayurveda are so misled. The tridosha is still an empirical theory, may be revealed through intuition, but like all theories in the field of science, it requires to be subjected to

experimental tests and analysis, and only then made the subject of authoritative instructions. Whatever truths may have been gained through intuition required precise application for being put to use in life. As Professor Bergson put it to doctor Tagore, "the East is essentially intuitive and the West precise" and both are necessary for life. Therefore it behoves us to conduct researches in the field of Ayurveda, take out such things as can be put in daily use and incorporate all that stand the test of experiment and research into the modern system of medicine. For a decade, I have been agitating for opening up in all medical colleges a post-graduate course of research in Indian systems of medicine. This is indeed the best service that one can render to Ayurveda and thus resuscitate it, but not by a blind allegiance to all its dogmas.

Guntur. G. V. HANUMANTHA RAO
24-6-47.

REVIEWS

PULMONARY TUBERCULOSIS—By R. Y. Keers and R. G. Rigden. Second Edition 1946. Crown 8vo., pp. 296 Illustrated. Published by E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. Price 17*s.* 6*d.*

The appearance of a second edition so soon after the first shows the popularity of this hand book. Pulmonary tuberculosis is an important subject which is engaging more interest of students and practitioners. This treatise fills in a long-felt want for a handbook on pulmonary tuberculosis where the subject has been described briefly, clearly and has also incorporated the advances in diagnosis and treatment. At the same time it avoids more specialised details in dealing with collapse therapy. In 15 chapters the whole subject is judiciously divided. The first chapter on historical survey will be interesting to the beginners.

Pulmonary tuberculosis is a subject full of mystery to a beginner. Side by side a student examines an afebrile patient with bilateral extensive lung lesion and a febrile young man with little lung disease getting worse day after day. In comparison the student finds the treatment easier but no less confusing. The authors have rightly laid emphasis on the patient as opposed to the disease in the lung. Sanatorium, and common methods of collapse therapy such as artificial pneumothorax and phrenic interruption are described in detail and with profuse illustrations. We welcome this book. We hope it will benefit the students and practitioners alike.

B. P. NEOGY.

CLINICAL PRACTICE IN INFECTIOUS DISEASES—By E. H. R. Harries and M. Mitman, Third Edition 1947. Demy 8vo. pp. 692. Illustrated. Published by E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. Price 22*s.* 6*d.*

Infectious diseases are common conditions which students meet in the ward and practitioners in their daily round. For the latter a clear conception and tactful handling of a case may make all the difference for their future. For the students 'fevers' are explained in the second and third chapters, which will also answer many questions that may arise in their mind.

In this edition the authors have added a new chapter in pneumonias—lobar pneumonia and short discriptions of the common cold, febrile herpes, epidemic nausea, vomiting, epidemic myalgia and infective polyneuritis. Other mentionable additions are descriptions on penicillin, streptomycin, biochemistry of dehydration, amino acid feeding, mass chemoprophylaxis. The knowledge of treatment and control of infectious disease is increasing every year. These have been responsible for the slight increase in the bulk of the book.

The book is liberally illustrated with charts, diagrams, histograms and coloured plates. To avoid repetition the main line of management of infectious diseases has been described in the three chapters towards the end of the book. For advanced students important references on the subject are given at the end of each chapter. Thus the book has been made exhaustive and full of upto date information for students and practitioners.

B. P. NEOGY.

PENICILLIN IN OPHTHALMOLOGY—By Indian Ophthalmologists, 1947. Demy 8vo. pp. 64, Published by Dr. K. Krishnamurti, Chodavaram. Price Rs. 3|-.

This is a small book written by an editorial committee of four. It has begun with a history of discovery of penicillin and has dealt with various clinical conditions in which penicillin is indicated. Special stress has been laid on its application in various ophthalmic disorders. Three of the articles in the book were originally written by three members of the editorial board and the rest are reprints from various journals. There is yet a good deal of difference of opinion as to the strength of penicillin that will give the best results when used as drops and it is too early to assess the value of penicillin in various intraocular infections.

B. K. DASGUPTA.

PENICILLIN—By B. Mukerji. Revised 1946. Demy 8 vo. pp. 22. Published by Art Press, Lahore. Price Annas 9 or 10*d.*

In a short pamphlet of 20 pages, Dr. B. Mukerji of Bio-Chemical Standardization Laboratory, Government of India, Calcutta, has givn a readable and up-to-date (Feb. 1946) account of Penicillin, which should be in the hands of all practising doctors and pharmacists. Much has been written and said about this drug and a number of good books have also been published during the last 2 years on penicillin. The busy practitioner however can hardly have access to these literature, and what they need is a short account giving the practical application of this drug. Just this has been provided by this little pamphlet. In addition to the chemistry, properties, absorption and excretion, unit of penicillin, detailed methods for preparing the drug for treatment, its indication and contra-indication and dosage for common diseases have been given in a form which could be adopted by any practitioner without recourse to reference books. The forms of penicillin that are available and which could be used in the various types of infections are also outlined.

We recommend the pamphlet, which is very low-priced, to all practitioners who can keep it on their table for ready reference. It is to be hoped that the pamphlet will be reprinted periodically incorporating the newer advances in the subject of penicillin which is making strides everyday.

P. G.

ARTIFICIAL RESPIRATION EXPLAINED—by Trank C. Eve., 1946. Crown 8 vo. pp. 80. Illustrated. Published by E. & S. Livingstone Ltd., 16 & 17, Teviot Place, Edinburgh. Price 3*s*. postage 3*d*.

In this little book the author has tried to show clearly with photographic illustrations the various methods of artificial respiration including the rocking method as used in the Royal Navy, in rescue boats and ashore. This will be of great practical help to the first aider as well as to the medical students.

P. G.

ACKNOWLEDGMENT

The Editor, *J. Indian M. A.*, acknowledges with thanks the receipt of the following books for review:

Clinical Practice in Intectious Diseases for Students, Practitioners and Medical Officers—By E. H. R. Harries and M. Mitman. Third Edition 1947. Published by E. & S. Livingstone, Edinburgh. Price 22*s*. 6*d*. net.

Handbook of Correctional Psychology—By R. M. Lindner and R. V. Seliger. Published by Philosophical Library, 15 East 40th Street, New York 16, N.Y. Price $10.

Vitamins in Health & Disease—By J. R. Goyal. Published by the Author, Delhi. Price Rs. 7/-.

Physicians' Hand Book—By J. Warkentin and J. D. Lange. Fourth Edition 1947. Published by University Medical Publishers, Chicago, Illinois. Price $1·50.

Atlas of Histopathology of the Skin—By G. H. Percival, A. M. Drenan and T. C. Dodds. First Edition 1946. Published by E. & S. Livingstone, Edinburgh. Price 75*s*. net.

A Handbook on Diseases of Children—By Bruce Williamson. Published by E. & S. Livingstone, Edinburgh. Price 15*s*. net.

The Psychology of the Unwanted Child—By Agatha H. Bowley. Published by E. S. Livingstone, Edinburgh. Price 6*s*. net.

Nutritional Disorders of the Nervous System—By J. D. Spillane, 1947. Published by E. & S. Livingstone, Edinburgh. Price 20*s*. net.

The Practice of Mental Nursing—By May Houliston, 1947. Published by E. & S. Livingstone, Edinburgh. Price 7*s*. 6*d*.

The Rotunda Hospital 1745-1945—By O'donel T. D. Browne, 1947. Published by E. & S. Livingstone, Edinburgh. Price 42s.

1946 Year Book of Obstetrics and Gynæcology. Published by the Year Book Publishers Inc., Chicago, Illinois. Price $3·75.

Nutritional and Vitamin Therapy in General Practice—By E. Gordon. Published by the Year Book Publishers Inc., Chicago, Illinois. Price $5·00.

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